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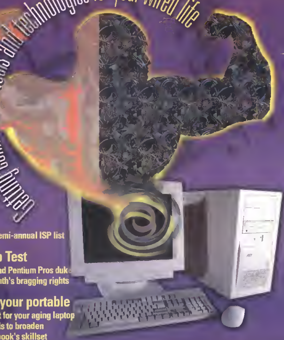

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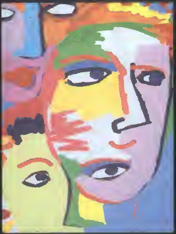

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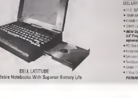

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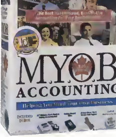

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FROM THE EDITOR

Who gets the best machines in your office?

You would think that as publisher of Canada's largest group of computer publications, I would have a 200 Mhz Pentium computer with 128 megabytes (MB) of RAM and multigigabyte (GB) hard drive. Not so.

Although we have some fairly high-end machines in our offices, I have been poking along on the equivalent of a 486 33 Mhz machine with 12 MB of RAM. With the growth curve our company seems to live on, there is always someone in our offices who can use the computer cycles more productively than I can. An established pecking order for high-end machines has emerged.

First in line come the desktop publishers who create the ads and lay out the articles in the paper. They are doing graphics-intensive tasks, which eat RAM and processor speed at a great rate. Editorial people usually warrant fast PCs for testing purposes. Next in line are accounting and servers. Finally comes sales, distribution and somewhere near the bottom is management.

I don't mean to cry the blues about this natural order that has evolved. Being at the bottom of the computer food chain is not so bad. I spend a lot of my work day in a handful of programs that are not very demanding in terms of computer speed—word processing, simple spreadsheets, browsing databases, the Web and e-mail.

Lately, however, I have been noticing a growing lag in performance. I recently added a PaperPort scanner to the mix of devices I regularly use. The PaperPort software program is not huge, but it pushed my other programs over the limit of regular RAM and my computer tapped into virtual memory, which is much s-l-o-w-e-r than regular RAM.

A (relatively) cheap upgrade

It was a pleasant relief recently, when I went out and splurged on a 32 MB of SIMM for my computer. It cost around $300 and made a huge difference to my computer system's performance. I can now load programs all day without bogging down into virtual memory. Life is good again.

What is RAM?

RAM stands for random access memory, meaning that any cell in the memory grid can be accessed directly by the CPU. (The CPU is the central processing unit—the computer in essence. If you buy a computer today, it is likely to be driven by a Pentium chip. The Pentium chip is the CPU.) When a program is loaded, a large part of the program—or all of it—is stored in RAM.

Virtual memory tricks the computer into thinking a portion of the hard drive is regular RAM. This is a great innovation because RAM until recently has been very expensive. Off-line storage has always been cheaper to produce than RAM, and lately, hard drives have dropped in price at an amazing rate. The trade-off is that virtual memory on hard drives is much slower than regular RAM. When you run out of RAM and start swapping information to electromechanical memory (the hard drive) the computer slows down considerably.

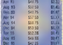
A brief history of RAM pricing

RAM is, of course, produced in many forms. In most desktop computers, RAM is usually installed as one or more single-inline memory modules (SIMMs). A number of varieties exist, including the currently popular EDO (extended data out) variety that many of the latest PCs support. The latest PowerMacs, on the other hand, use a so-called dual inline memory module—go figure.

To make a long story short, RAM has become a commodity made in a small variety of fairly standard packages. RAM, until recently, has also been made by a small number of very expensive-to-build factories in Japan and Korea. American manufacturers have basically dropped out of the RAM production market. Because there were so few producers and demand has remained high, the pricing has been stable—and high—for a number of years.

A while back, there was a fire in Japan at one of the few plants that produced the resin important in the manufacture of RAM. This caused a temporary hike in the price of RAM. Lately, a number of newer factories have come into production and all of a sudden there is competition in the world of RAM production. Prices have accordingly been dropping, though RAM is still much more expensive than hard-drive memory.

To give you an idea, I went back and checked the prices of RAM and hard drives over the past nine years that *The Computer Paper* has been in print. The chart below shows the drop in the price per megabyte.



Month	RAM Price/MB	HDD Price/MB
Apr 93	$48.75	$2.3[illegible]
Aug 93	$52.50	$1.4[illegible]
Dec 93	$48.75	$1.4[illegible]
Apr 94	$57.50	$1.[illegible]
Aug 94	$58.75	$1.[illegible]
Dec 94	$53.50	[illegible]
Apr 95	$52.38	$0.41
Aug 95	$49.88	$0.47
Dec 95	$42.25	$0.31
Apr 96	$25.00	[illegible]
Aug 96	[illegible]	[illegible]

What if?

I can't help wondering what would have happened if RAM had come down in price at the same rate that the prices of hard drives have dropped. What if 1 GB of RAM was standard in new machines?

If large amounts of RAM were sold in base-level systems, program designers would radically change the way they designed their programs. This would have altered the way computers are used. A human evolutionary equivalent might be if, instead of having difficulty keeping more than seven items in our short-term memory, all humans were born with photographic memories. The possibilities would be exciting.

Moral of the story

Buy some new RAM. It is one of the most effective and least-expensive upgrades you can perform on your computer. In most cases, it is easier than adding a new processor or a larger hard drive, and it is much cheaper than buying a new computer. The extra speed will make everything you are working on seem fresh again.

Enjoy the issue.

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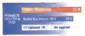

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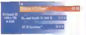

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All performance tests conducted by Matrox Graphics Inc. on a Gateway P5-166 configured with Intel P5 166MHz, 16MB of EDO RAM with 256K cache. The Matrox Millennium, Number Nine Imagine 128 Series 2 were configured with 4 MB of memory using driver releases 3.17 and 2.06 respectively. The S3 Lightspeed 128 was configured with 2.25 MB of memory using driver release [illegible] and could not be expanded to support 1024 x 768 at 24-bit. Matrox Mystique, Diamond Stealth 3D 2000XL and ATI 3D XPRESSION were configured with 2 MB of memory for the PCI but using driver releases 3.12, 1.00 and 2.22 respectively for Windows 95. WinBench 96 1.0 tests conducted at 1024 x 768 resolution with 8-bit and 24-bit color at 75Hz refresh using large fonts under Windows 95.

C-64 fan appreciates retrospective

Thanks for running Linda Richards's article "Turning your Pentium 100 into a Commodore 64" in your September issue. I was one of those "unsuspecting consumers who had visions of computing dancing in their heads" that she referred to. Well, not quite unsuspecting. I had first gone through the Vic-20 stage, and getting a C-64 was, for me, an upgrade after having spent a fortune on RAM expansion modules for the old 3K Vic!

It was interesting to read about the C-64 phenomenon from the author's perspective as a reluctant purveyor of those lovable lemons. If it's any consolation to her though, like many C-64 owners, I learned to put the machine to good use—in my case, as an excellent word processor—and I was sad when I finally let it go so many years ago.

Anyway, the article brought back warm and fuzzy feelings about a machine that, for all its failings, got me permanently hooked on computers. Visiting the Commodore-oriented Web sites mentioned in the article further heightened the nostalgia. All in all, the reading and browsing experience made me imagine for an instant that I was typing this message, not on the keyboard of a Pentium 133, but on that memorable beige Commodore keyboard.

Po Wong, via Internet

Displeased with student PC lab test

While reading the September lab test article, I was dismayed to find that nowhere was it mentioned that a person should consider what school the student is attending as one of the criteria for selecting a system.

I would suggest that, prior to selecting any of the PCs recommended, you first check what the school itself recommends. This is particularly true if parents are buying a PC for their children. While many secondary schools in my area use PCs, the vast majority of primary schools use Macintosh computers; purchasing a PC for a student attending such a school would not be terribly useful.

As well, there are a number of faculties in various universities that use a high number of Macintosh computers.

Ignoring this option, I feel, is a disservice to your readers.

Norm Palardy, via Internet

CF replies: In principle, I agree that it could have been noted that the choice of school is an issue that may bear consideration. However, I do not agree that you should use the same type of computer as the school. Computers are just tools. My feeling is, use whatever works for you. If a child uses a PC at home and a Mac at school or vice versa, I would imagine that in the scheme of things he or she could be better off in the long run. Futhermore it's not that difficult to transfer files between the two platforms these days.

Unix defender rants at Mac user smugness

In the September issue, you finished your editorial by saying "if there were no Macintoshes, Microsoft would have no one to steal good ideas from."

This unjustifiably smug attitude on the part of Mac users caters to the belief that Apple invented the GUI. Nothing could be further from the truth. In the 1970s the UCSD Pascal system (which later ran on Apple's) had a similar look to the modern Mac screen, with a pull-down menu bar at the top of the screen that changed depending on which application you were running.

The GUI (graphical user interface), as we know it today, was developed at Xerox PARC in the early 1980s. A few years later, at around the same time, Sun Microsystems released its SunView environment, and Apple released LISA, which later metamorphosed into Macintosh. GUIs ran on other Unix platforms even earlier.

Apple has no moral high ground when it comes to "stealing ideas." How long did it take Macintosh to get around to having a scripting language, multitasking, or virtual memory? Unix had all these things from the beginning. Most of the important developments in networking were invented in Unix. The Internet and the World Wide Web, including FTP, telnet, Mosaic, Netscape and Java, originated in Unix. Mac users seem to be unaware of these facts.

The inadequacy of the Macintosh platform to perform in the networked world is underscored by the recent decision of Apple to market a (dare I say it?) UNIX network server running IBM's AIX. (Even Apple's own Unix, AUX, had to be abandoned here.)

Brian Fristensky, Winnipeg

Thanks for the memory advice

I have a 660 AV Macintosh and a 486DX2-80 DOS machine. The AV has 12 megabytes (MB) of RAM and RAM Doubler installed. The 486 has 8 MB installed. If I purchase a new 16 MB 72-pin, 70ns or faster SIMM (single inline memory module) composite non parity chip, will it run okay in the Mac? I have been getting conflicting advice from Apple local techs and plain users. The SIMM I am considering would fit in both the Mac or 486 machine physically. What is the low-down on all this chip confusion? Do I really need to spend $300-plus for a non-composite SIMM?

Thanks for a great newspaper, I read it cover to cover.

Jockel Carter, Halifax

Steve H replies: The machine in question, the 660AV, is capable of accepting a 16 MB 72 pin SIMM, so long as it is non-parity. For the sake of playing it safe, I would recommend you go with 70ns, as opposed to 60ns, simply because both machines are on the slower side in terms of clock speeds, and there is a very good chance that a 60ns SIMM would not work at all.

Continued on page 16

The new HP DeskJet 680C. Now colour banner printing is fun, simple and within reach of everybody.

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WHAT'S NEW

And Netscape begat Navio ... and everyone got connected • Netscape Communications Corp., the leader (with about 80 percent of the market share compared to Microsoft's three percent) in Internet browser software development, has formed Navio Communications Inc., a new venture aimed at developing technology that can link consumers to the wired world of the 21st century, even if they lack access to a personal computer. In a strategy that seems to parallel Bill Gates's vision of "pocket computers" and other tiny smart net-workable consumer gadgets, Navio aims to bring the Internet to anyone, anywhere, anytime.

Netscape established Navio to separate this new technology direction from Netscape's core business, which is selling products and services that connect businesses' computers to the Internet.

The head of Navio is Wei Yen, former head of product development for Silicon Graphics, Inc. Yen envisions access to the Net broadening from its PC focus to incorporate television sets, phones and new consumer electronics devices such as the "Wallet PC." Low-cost Internet access will also be a boon to education all over the world, according to Netscape representatives. If Navio's technology reaches the market in a practical form soon, it may be the basis for making the much talked about, mythical $500 Internet computer a reality. That Internet computer, however, may well look more like a TV set, or a touch-tone phone, or a pocket calculator.

Netscape is very conscious that Microsoft has had the company in its gunsights for over a year now. Bill Gates says that he wakes up in the morning "thinking of browser software market share." This has led Netscape to bolster its initiative by enlisting a number of heavy hitting allies in its new Navio venture. Although Netscape is the majority player in Navio, some key strategic partners, including IBM, Oracle, Nintendo, Sega, NEC and Sony, have minority stakes in the new company.

The presence of video games companies hints at what some of the early applications for Navio technology might be. In addition to education and electronic commerce, many observers are betting that online games will become the multi-billion dollar "killer application" of the new improved Internet. —JE

Contact: Netscape Communications,
Web site: http:// www.netscape.com

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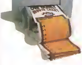

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Classic Rock Guitar interactive music education • Ubi Soft Entertainment, a company best known for its entertainment software, has launched Classic Rock Guitar, Vol. 1, the first title in its new Learn & Play edutainment software series. According to Ubi Soft, Volume 1 "delivers essential guitar skills via songs from some of rock's all time greats including Bob Marley, Stevie Ray Vaughan, Bob Dylan and Jimi Hendrix." Classic Rock Guitar claims to offer the equivalent of months of guitar lessons, employing the large data storage capability of CD-ROM and exploiting the multimedia capabilities of a PC. The software employs "video demos, scrolling notation, live chord diagrams, and stereo quality sound resulting in a lively learning experience," according to Ubi Soft. Over 80 lessons and 180 exercises are linked. Volume 1 has a street price of about $70. —JE

Contact: Ubi Soft, Tel: 416-547-4000
Web site: http://www.ubisoft.com

Survey puts Corel on top for retail sales of office suite software in U.S • Ottawa based Corel Corp., for years the leader in Windows graphics software with its Corel DRAW family of products, announced that—according to American research firm PC Data—its recently released Corel WordPerfect Suite has captured 50.9 percent of the retail sales in the office suite software category in the key United States market. The PC Data survey put Microsoft in second place with 44.7 percent, and Lotus in third with 4.3 percent of the office-suite software market.

Corel was widely considered to have picked up the WordPerfect line from Utah-based Novell Corp. earlier this year at a bargain price. The acquisition was seen as a make or break gamble by Corel's founder Michael Cowpland, and the survey data is an indication that his bet is paying off.

Corel has been extremely aggressive in marketing its new acquisition, evidently to very good effect. WordPerfect had an installed base of an estimated 20 million users, and obviously there was a demand by loyal WordPerfect customers for this latest version of the program. Corel recently signed an agreement with U.S. based Packard Bell to bundle WordPerfect with that company's PCs, which could potentially add millions of new users worldwide to the user base.

Corel may have achieved its success in the retail market because retail purchasing decisions are made by individual computer users, many of whom recognize and value the Corel and the WordPerfect brands.

In the corporate office-suite software market, however, Microsoft still dominates due to that company's success in marketing its Microsoft Office products as the safest and most comprehensive bet for enterprise computing needs. It would be unusual for Microsoft not to respond strongly to this challenge by Corel, but for now Corel is basking in the glory of having given the world's biggest PC software maker a short, sharp lesson in how to increase market share.

Perhaps to rub some salt in the wounds inflicted on their erstwhile close ally Microsoft, Corel announced that the company will bundle a copy of Netscape Navigator with Corel Office Professional 7 and CorelVIDEO Remote and other products to be announced. —JE

Contact: Corel, Tel: 613 728-0828
Web site: http://www.corel.com

Word Macro virus announced • Look Software Systems Inc. in Ottawa has announced VirusAlert for Macro, which is designed specifically to combat the Microsoft Word Macro virus. The product can be ordered directly from Look Software by calling 1-800-678-5511. An evaluation copy of the software can be downloaded from the company's Web site at http://www.look.com/

Connectix releases color QuickCam • In late 1994 Connectix released the first low-cost digital video camera for Macintosh and PC computers. The little ball-like camera was an instant success, providing video or still black and white images when hooked up to a computer. It was small, easy to use, and cheap but, alas, colorless.

Now with Connectix's new release the computer can see the world in color. The Color QuickCam connects directly to the back of the computer so it goes wherever your computer goes. It can take still pictures in full 24-bit color at a 640x480 resolution. The manually adjustable lens can focus on objects from a distance of less than 2.5 centimetres to infinity. Since most people are likely to use this device connected to their desktop computer, the camera has been optimized for indoor lighting.

Connectix has also developed a new video compression technology for the camera, so it delivers more images per second. It can be used as the video input for Internet videoconferencing, to tak[illegible] yourself [illegible] photos for presentations or shoot quick clip movies. The suggested retail price for the Color QuickCam is $359.99. —KSR

Contact: Connectix Corporation, Tel: 800 9505880
Web site: http://www.connectix.com/

Microsoft releases Close Combat for Windows 95 • The French philosopher Voltaire once commented that any army composed of rational men would always simply run away. However, this attitude of "discretion before valor" has not generally been popular with the makers of computer war games. Digital soldiers tend to be remarkably indifferent to their continued survival.

Microsoft, however, has recently released a military simulation title called Close Combat that not only supplies plenty of strategy and noisy carnage but also applies artificial intelligence style variety to the digital cannon fodder's enthusiasm to die for the cause.

Essentially, Close Combat is a game that replays an actual 1944 battle between the U.S. 29th Infantry Division and the German 352nd Infantry Division. Players choose to be the commander of either of the two sides. The game creates a fairly standard computer-generated battlefield and the "commanders" issue orders to their troops.

What makes this war game different is that, although players make the big decisions, it's impossible for them to micro-manage the individual soldiers. So, as in a real battle, soldiers run, shoot and are wounded or killed. If conditions get too bad, they may even refuse to obey orders. Players have to try to develop plans that can be achieved and conserve lives.

The game graphics are decent and effective though not outstanding. Video clips, pictures and text included in the CD-ROM give you a better idea of the events the game is based on. For the gamer who'd like to exercise his or her mind while leaving room for the troops to exercise theirs, this is a clever, involving game. —JE

Contact: Microsoft, Web site
http://www.microsoft.com

Toshiba introduces 150 MHz Pentium multimedia notebook • Toshiba of Canada Information Systems Group (ISG) has announced the new Tecra 730 CDT notebook, based on the latest Intel 150 MHz low voltage processor.

Toshiba, the leading vendor of notebooks in Canada, has tended to fight for the technological high ground in terms of leading-edge technology. The Tecra 730 CDT is its current dream notebook.

The 730 CDT is intended as a full featured replacement for a business desktop PC, with a standard 16 MB of EDO DRAM (expandable to 144 MB), 256K cache, internal PCI system bus and external PCI expansion architecture, a 12.1-inch

►

1024x768 active matrix screen 2 MB EDO video memory optional MPEG card slot, 6x CD-ROM drive 16-bit audio 2.1 GB hard drive, V.34 modem, and 2 PC card slots. The suggested list price is $9,549 and includes a three-year international warranty

Contact Toshiba of Canada ISG Tel 905-470-3478
Web site http://www.toshiba.com

Lotus Canada announces new cc:Mail Release 7 for Win 95 • Lotus Canada has released cc:Mail Release 7 which according to the company is "a major new 32-bit client for the world's best selling e-mail system, that offers advanced messaging features and additional flexibility to back end communications." The new cc:Mail features a redesigned user interface to aid in handling large volumes of e-mail, enhanced Internet integration and features such as message sorting, message threading, nested folders for storing messages in organized easy to find hierarchies, and customizable rules to give users and system administrators more control and options over how the program functions.—*JE*

Contact: Lotus Canada. Tel 800 57 LOTUS
Web site: http://www.Lotus.com

Xircom makes modem kit for world travelers • Anybody who has travelled extensively around the world with a laptop and modem knows that connecting to home office or the Internet through a modem is not always easy Even if the telecommunication system is top-notch, not every country uses North America's convenient plug-in jacks

Xircom has come to the rescue of modem weary world travelers with the International Modem Travel Kit The kit comes with a dozen telephone adapters that convert country-specific connectors to the standard RJ-11 connector used by PC Card modems The kit can connect to over 160 telephone systems around the world The International Modem Travel Kit has a suggested retail price of $179 —*KS-R*

Contact: Xircom Tel 800 665-3284
Web site: http://www.xircom.com/

3D for the masses (At last?) • As a teacher of high-end 3D animation at a Toronto college this writer can testify that learning how to use the software for this work is no easy task So it was with great enthusiasm that I learned of the release of two truly powerful *and* easy-to-use 3D graphics titles from Texas-based Micrografx

Instant 3D is a truly user friendly entry-level 3D program that allows you to create 3D text and graphics with a minimum of time spent reading complex manuals. The program is designed to work with any OLE 2.0 compliant applications program such as MS PowerPoint or a word processor Instant 3D can be loaded so that it adds a Button Bar and Menu Option to your business software, giving integrated 3D graphics capability to the program you are using Instant 3D offers a catalog of 3D objects that can be textured rendered and inserted into slideshows or documents It also uses the standard Windows TrueType fonts allowing the user to extrude color deform and add textures to text.

Visual Reality 2.0 is a more full-featured 3D design program, offering remarkably easy modeling of 3D shapes either from scratch or using a large library of pre-made 3D objects. The program offers a wide range of camera movement and rendering options The program also comes with 9 Simply Scenes pre-modeled environments and objects including a Jurassic adventure landscape complete with dinosaurs, a castle space station, and others Visual Reality is the perfect entry level animation program, close to a high-end 3D program but at a much lower cost and with a much easier learning curve Micrografx seems to be positioning itself to be the mass market toolmaker for graphics animation and Internet publishing enthusiasts (including those interested in creating online 3D VRML sites), and these two packages are a significant step in that direction Instant 3D has a retail price of $69.95 while Visual Reality 2.0 is priced at $269 —*JE*

Contact Micrografx, Tel 800 360-8464
Web site http://www.micrografx.com

Ray Dream Studio 4.1 for Mac adds Internet support SuperMesh extension • Ray Dream Studio 4.1 for the Macintosh released

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When it comes to bundling a system the Optiquest® Value Line Monitors by ViewSonic offer everything you expect in high-performance monitors – without the high price tag In fact the value is so great you would be wise to enhance your new system by choosing any monitor shown on these two pages! ViewSonic the award-winning monitor company has one "just right" for your budget and application.

Technical Comparison
Optiquest V775 and other 17" (various viewables) monitors.

	Optiquest V775	NEC XV17+	MAG DX1795	Samsung 17GLi
Actual Viewable Size	16.0"	15.6"	16.1"	15.8"
Dot Pitch	0.26mm	0.28mm	0.26mm	0.28mm
Horizontal Frequency	24-82KHz	31-65KHz	30-65KHz	30-65KHz
Bandwidth	135MHz	85MHz	100MHz	110MHz
1 280 x 1 024 @ 75Hz	Yes	No	No	No
1 024 x 768 @ 85Hz	Yes	No	No	No
CRT Warranty	3 Years	3 Years	2 Years	3 Years
EDP (MSRP)' CDN	$955	$1,167	$1,029	$1,194

Optiquest V775 Performance
The Optiquest V775 17" (16.0" viewable) monitor provides a bundle of features at a surprisingly affordable price With its flat square screen ultra fine 0.26mm dot pitch, 1 600 x 1 280 maximum resolution and Invar Shadow Mask you can be sure of incredibly sharp screen images And you get extraordinary performance from other powerful features such as OnView® controls for easy one-touch adjustments and the advanced ViewMatch® color management system to match screen colors to your color printer

Optiquest Value
Optiquest monitors exceed energy certification and emission standards including VESA® DPMS™ and MPR II, and offer *Plug & Play+* for compatibility with Windows® 95 All these monitors are backed by a limited three year warranty as well as ViewSonic's Express Exchange℠ Service option, which provides

in mid-August. It a[illegible] major new features including support for Apple's QuickDraw 3D standard, a file export filter for VRML, GIF and JPEG formats for Web publishing, visible animation motion paths, improved anti-aliasing, and the SuperMesh extension for generating organic looking shapes that can be animated.

Ray Dream Studio is a very solid, well featured mid-range 3D animation package. It features a good set of tools and a user interface that requires a fair amount of time to master. The SuperMesh extension is an additional title, developed by Zonstar Software, which allows users to take a computer image or animation and wrap it around a 3D geometric object such as a sphere or cylinder. Mesh animation can be used to create powerful animated special effects, especially for video titling. Ray Dream Studio has a street price of about $450. —*JE*

Contact: Fractal Design Corp. Tel. 800 846-0111
Web site: http://www.fractal.com

New GVC ISDN terminal adapter • Since Bell Canada began actively promoting ISDN (integrated services digital network) hookups in this country there has been a great increase in the number of ISDN terminal adapters available here—notably the Motorola BitSurfer line. The latest entries into the Canadian market are the GVC ISDN 128U/v.34 external digital/analog modem and the GVC ISDN 128U 16-bit ISA internal terminal adapter. Both products are aimed at high speed telecommuting, LAN-to-LAN connectivity [illegible] ing [illegible].

Both models require a BRI ISDN phone line, which are increasingly available in major urban centres, and a PC running Windows 3.x or Windows 95. They offer a maximum speed of 128Kbps (four times faster than current modems) and support Win 95 Plug and Play for easy installation. They are compatible when communicating with slower 28.8Kbps modems, and offer the ability to use one 64Kbps line for voice while reserving the other 64Kbps line for data. They also support the standard telecom protocols such as TAPI and the AT command sets. Canadian pricing is $499 for the external and $449 for the internal model. —*JE*

Contact: GVC. Tel. 905 738 9300, or tech support line 888 GVC-TECH. Web site: http://www.gvc.ca

Canadian police briefed on need to become Net experts • The need to give law and order a strong online presence has been highlighted recently by Ontario's announcement that it is linking all the elements of its justice system electronically and by a meeting of police officials that focussed on online crime.

American police experts held forth to an audience of Canadian police on how the Internet has become the pervert's highway as pedophiles have taken to using it to share pornographic materials, find like-minded criminals, and even disseminate information on how to abduct children and avoid prosecution.

The good news is that, according to the American experts, the Internet can also be used as an effective police tool for surveillance and to gather evidence which can be used in investigations and prosecutions. But in order to do this, police need to become as or more proficient with the new technology than their quarry. —*JE*

Symantec Antivirus 2.0 for Win95 features expanded Internet functions • Symantec Corp. has announced the latest version of Norton AntiVirus (NAV) for Win 95, which the company says "gives users the security of knowing that they have the most complete virus protection possible, whether they are downloading files from the Internet, opening attached Word documents or accessing a floppy disk."

NAV 2.0's main new features include LiveUpdate, a one-button update capability that allows registered users to download the latest anti-virus software from Symantec; Striker, a "next generation" scanning engine, which is aimed at detecting the next generation of polymorphic viruses (a new class of viruses that mutate themselves to outwit antivirus software); and a Repair Wizard to make virus repair less terrifying to an average PC user.

Symantec has been a leader in offering monthly updates via modem to registered users, and according to Mary Engstrom, the general manager of Symantec's AntiVirus business unit, "with LiveUpdate we offer a revolutionary new way to get those updates onto your desktop with tremendous ease." To detect polymorphic viruses, the Striker feature of NAV 2.0 sets up a Virtual PC space to act as a "clean room" where the software can execute a suspect file without endangering the PC's hard drive.

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WHAT'S NEW

NAV 2.0 retails for $99. The upgrade, for registered users, is priced at $41.95. —*JE*

Contact: Symantec Canada, Tel: 800-441 7234
Web site: http://www.symantec.com

Eyewitness photo gallery • General Publishing, the Canadian distributor of Dorling Kindersley educational software, has announced the release of its Eyewitness Photo Gallery, a series of CD-ROM titles each containing 100 professional digital photos of various subjects (Vol. 1 is Cats, Vol. 4 is Children, etc.)

At a mere $12.95 each, these discs are priced to compete with Corel's extensive line of PhotoCD titles, which dominate the CD-ROM stock photo library.

The Eyewitness images are intended for limited personal, school or non-commercial use (in other words, the licence agreement permits you to use the images for slideshows, or with consumer graphics and publishing programs such as PrintShop, or Color Shop Plus, but not for commercial advertising or packaging illustration). —*JE*

Contact: General Publishing, Tel: 416 445 3333

Trading cards with byte • Although the worst of the sports-card craze has abated since the phenomenon reached a frenzied state earlier this decade, fan interest in the facts and figures of sports greats' careers is undiminished.

And in an attempt to profit where sports-stats obsession meets computer PC ownership, Topps—one of the leading trading card publishers—has released NFL CybrCards.

The "cards," which are actually CD-ROMs, bring an unusual degree of interactivity and multimedia depth to the study of one's favorite sports heroes. According to Topps, the CybrCard CD-ROMs offer "full-contact interaction with the NFL's best—and you command the action. You'll get so deep in their careers, you'll feel like you're in their jerseys." Blechhh!

These CD-ROMs each cover a single football star's career. Each disc includes a Film Room with video clips including 1995 season highlights, plus clips from every season the player has had since his rookie year. There's a Statistician's Office that gives every conceivable category of performance statistic. Stats are linked to included photos and audio and video clips where appropriate, so the user can see the player actually generating those high scores. The Head Coach's Office lets you analyze chalkboard diagrams of key plays frame by frame. The Scouting Department lets you simulate the player's performance under different user-definable circumstances. And a Photo Lab section lets you take any image and create and print out your own trading card for the player. All this, plus a trivia game, press clippings, insider NFL info and more.

Each CD-ROM has a street price of about $25 or $65 for a 3-pack. There are 28 NFL cards in total and Topps is planning a line of major league baseball titles for 1997.

Contact: CybrCard, Tel: 800-436-7722 or 212-882 3506

Canada's Vivid Group supplies educational virtual reality around the world • Toronto-based Vivid Group has become the world leader in educational Virtual Reality with its "full body immersion" Mandala system, virtual reality technology that merges video and computer systems to provide simple to use computer generated environments. The bulk of Vivid's Mandala installations are located outside Canada, many in public education facilities such as the Taichung Ocean Aquarium in Taiwan, The Seattle Children's Museum, the Pusang Children's Museum in Korea, and the Hockey Hall of Fame in Toronto. —*JE*

Contact: Vivid Group, Tel: 416 340 9290
E-mail: gogo@vividgroup.com
Web site: http://www.vividgroup.com

Nintendo 64 launched in Canada • Nintendo has announced the availability of its new Nintendo 64 video game system in Canada. Based on a high-speed RISC processor from Silicon Graphics, the Nintendo 64 is the latest in a series of "next generation" video games systems (including the Sony Playstation, the Sega Saturn and the 3DO) which are designed to offer performance as good as or better than the best current multimedia PC, but at a much lower cost.

The Nintendo 64, from *TCP's* initial hands-on test, is hands down the winner in terms of its ability to create fast, complex 3D animation. It frees the user completely from the old 2D scrolling backgrounds of 16-bit video games machines and PC game software, and replaces it with the highest quality 3D environments we've seen.

Continued on page **14**

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http://www.epson.com

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Continued from page ***12***

The Nintendo 64, which is intended to sell for a street price of around $350, is designed to play games from cartridges rather than CD-ROMs. The cartridges only have about 12 MB of storage capacity, not much compared to the 650 MB capacity of a CD-ROM. However, the initial titles we've played make the most of the limited storage capacity.

The flagship title, part of the Super Mario series, features a 3D version of Mario with extremely lifelike movement, navigating the hazards of a giant 3D castle. Using the two-handed controller pad, the player can literally fly from his or her point of view to anywhere in the game's 3D space. Effects like fire explosions, water shadow, clouds and fog are all beautifully rendered in perfect 3D perspective views in real time. It's fun to just have Mario walk, run and jump around the castle to see what's there. Because of the 3D navigation capability, literally no two play experiences can be the same—the point of view is always different.

Because of the storage limitations, sound and music are synthesized by special chips in the Nintendo 64 device, rather than played from a CD-ROM. Similarly, the number of texture maps available are limited, and digital video clips are simply unavailable. On the plus side, though, there are never any pauses while waiting for large files to load off a CD-ROM drive or a computer hard drive—transitions are virtually instantaneous, and gameplay is very fast and responsive.

The Nintendo 64 exceeds the 3D performance of all the PC systems that this writer has seen on the market.

It is an astonishing technical achievement, and the initial game releases are uniformly excellent. One drawback is that the 12 MB cartridges are pretty expensive to make, compared to pressing a CD-ROM, and they run around $90 to $120 a pop—fairly steep for a game. For the dedicated gamer, though, the Nintendo 64 is the coolest machine on the market. —*JE*

What's New is compiled by Jeff Evans, Keith Schengili-Roberts, Chris Fisher, Graeme Bennett, David Tanaka and Megan Johnston.

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Digital justice for Ontario

BY JEFF EVANS

On Aug. 21, Ontario Solicitor General Robert Runciman announced a major initiative to electronically link all elements of the justice system of Canada's most populous province. Even as the legal system staggers under ever increasing volumes of paperwork, it has failed to make use of available computer network and telecom technology that is routinely employed in industry.

"Police, prosecutors and correctional officers currently recreate the same files as many as six to nine times because our information systems simply can't talk to each other. Prosecutors will tell you that they don't even have access to a computer right now. We need a private sector partner to help us move into the 21st century," according to Runciman.

Within four years, Ontario hopes to have an integrated computer system that will allow data to be captured once, not several times as is currently the case, and shared effectively among police, prosecutors, criminal and civil courts, correctional institutions, probation and parole offices and the Ontario Board of Parole," he says.

The government expects large benefits to accrue from the computerization project, ranging from reduction of time spent creating and accessing paper-based files, improved court scheduling, streamlined case management and inmate tracking, and better coordination of the different branches of the justice system.

Runciman claims that the program will be paid for by the cost savings of a more efficient system. "The supplier will undertake the costs to design and implement the required solutions in return for a share of the financial savings that will accrue once the redesigned business process and computer systems are in place."

One experienced trial lawyer who spoke to *TCP* claims that this technology will be a mixed blessing to the legal profession.

"Many routine jobs done by law firms will be speeded up or eliminated by this kind of technology," he said. "We're probably producing more new lawyers than there will be work for once many functions that currently need the intervention of a lawyer can be done faster with the aid of a computer network." ❑

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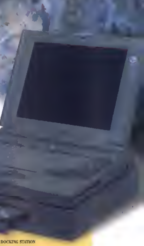

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Specifications	Standard	Optional
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Memory	8MB EDO RAM	*8, 16, 32 MB Memory Card Upgrades*
Display	Dual Scan Colour LCD	*TFT Colour*
Storage Device	FDD: 1.44 MB 3.5" HDD: 540MB Removable 2.5"	*HDD Options: 810MB, 1.2GB*
Keyboard	84 Keys 8 Hot Keys	*PS/2 Type 101 Keyboard*
Pointing Device	Integrated Trackball	*PS/2 or Serial Pointing Devices*
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PCMCIA	1 Type II Slot and 1 Type III Slot	
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Continued from page 8

unless you tinker with wait-state settings and assuming your BIOS will allow it. As for the $300 price tag, those dark days are no more. You can go and pick up a 16 MB SIMM (72-pin, 70ns) for less than $200, or sometimes less than $120 in major metro areas.

Is MMX worth the wait?

I am thinking about buying a new Pentium 200 system. However, I was wondering if I should wait until the end of this year when the MMX chip is out. What is so special about the MMX?

Richard Ngun, via Internet

CP replies: Intel has pushed the release time of the MMX chip back; it is now slated for release in the first quarter of 1997. MMX will speed operations for a number of program events, mainly in the area of multimedia. The question of whether to wait to buy a computer is a common one. Prices for computers will remain fairly stable until at least the end of this year.

MMX will bring a significant performance increase, and if you can do without a new computer until then it might not be a bad idea to wait. If you're itching for a new one, or you need one to work on immediately, then I wouldn't worry about not having MMX too much. A Pentium 200 is a fairly capable beast anyway. Also bear in mind that when the MMX processors are first introduced, they will likely have a premium price.

Correction

In our September '96 issue, our Test Lab feature, "School Tools" stated that the system from Compucon was equipped with 512K of Level-2 cache. Although this number is correct, we neglected to mention that it was of the pipeline burst variety. Also we were informed that the system also includes a 14-inch monitor at no extra cost, making the system all the more attractive.

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ADSL group looks to extend capacity of existing telephone lines to meet the needs of the digital age

ADSL BREATHES NEW LIFE INTO THAT PLAIN OLD PHONE WIRE

BY GEOF WHEELWRIGHT

Everybody wants to offer you a fast connection to the Internet—for high speed Web browsing, for demanding applications such as video-conferencing, or for the use of heavy-duty Java-based applications. There is a reluctance, however, by consumers to pay a huge premium for such performance (as is typically demanded by providers of digital ISDN telephone lines).

Enter a new technology known as asymmetric digital subscriber line (ADSL), which promises access speeds that go beyond those promised by both ISDN (integrated services digital network) and "cable modems" hooked up to cable television lines. ADSL is designed to work over existing telephone lines and could therefore deliver this kind of performance without the high cost traditionally associated with either of the other two most highly touted access solutions (which both require considerable infrastructure investment by telephone and cable TV companies).

According to the ADSL Forum, a North American/European industry group established to promote the ADSL standard, telephone companies around the world are beginning to recognize the immense value they can still realize from their existing copper telephone lines—and that they can begin to offer high speed access quickly without spending lots of money on infrastructure.

The group describes ADSL as an asymmetric modem capable of transmitting movies, television and high speed data over long copper links, and says it has proved itself in the field and now descends the learning curve in anticipation of wide scale deployment. It also says that VDSL, a turbo charged modem that has been moving into field trials this year, can transmit HDTV (high-definition television) and many channels of live television and high speed data over shorter lines.

"The two make an amazing combination, offering rates from 1.5 Mbps to 52 Mbps, depending on line length, over the very same wires used for plain old telephone service (POTS)," says the forum in a report published on the World Wide Web. "Indeed, ADSL and VDSL share the line with POTS, enabling telephones, fax machines, personal computers, and televisions to connect to remote services over a single line at the same time."

> **These integrated transceivers support both STM (synchronous transfer mode) and ATM (asynchronous transfer mode) transmission speeds up to 8 Mbps, which is about 600 times faster than with today's common, 14,400 bit-per-second (bps) modems**

The ADSL Forum was formed in late 1994 "to help the telecommunications community understand and apply" ADSL technology. Focusing first on ADSL, the forum promotes the concept of copper access for broadband services and develops practical solutions for system problems engendered by ADSL and VDSL networks. The forum pays particular attention to the near term, when it says ADSL will be deployed along a migration path toward asynchronous transfer mode (ATM), but before ATM becomes widely distributed.

Copper lines can be used now for video on demand, Internet access, remote LAN access and multimedia access. As a consequence, solutions must be developed now for wiring, premises distribution, terminal interfacing, link protocols and network management, all in conjunction with evolving network paradigms.

"ADSL will play a crucial role over the

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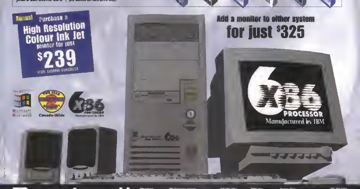

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ADSL

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next 20 years as telephone companies enter new markets for delivering information in video and multimedia formats. New broad band cabling will take decades to reach all prospective subscribers. But success of these new services will depend upon reaching as many subscribers as possible during the early years," the report states. "By bringing movies, television, video catalogs, remote CD-ROMs, corporate LANs, and the internet into homes and small businesses soon, ADSL will make these markets viable for telephone companies and application suppliers alike."

How does it work?

According to the forum, ADSL depends upon advanced digital signal processing and creative algorithms to squeeze so much information through twisted-pair telephone lines. In addition, it says many advances have been required in transformers, analog filters, and analog-to-digital (A/D) converters.

"Long telephone lines may attenuate signals at one megahertz (the outer edge of the band used by ADSL) by as much as 90 dB, forcing analog sections of ADSL modems to work very hard to realize large dynamic ranges, separate channels, and maintain low noise figures," explains the group. "On the outside, ADSL looks simple—transparent synchronous data pipes at various data rates over ordinary telephone lines. On the inside, where all the transistors work, there is a miracle of modern technology."

The "miracle" is this: to create multiple channels, ADSL modems divide the available bandwidth of a telephone line in one of two ways: frequency division multiplexing (FDM) or echo cancellation. FDM assigns one band for upstream data and another band for downstream data. The downstream path is then divided by time division multiplexing into one or more high speed channels and one or more low speed channels. The upstream path is also multiplexed into corresponding low-speed channels.

Echo cancellation assigns the upstream band to overlap the downstream, and separates the two by means of local echo cancellation, a technique well known in V.32 and V.34 modems. Echo cancellation uses bandwidth more efficiently but at the expense of complexity and cost. With either technique, ADSL splits off a 4KHz region for POTS at the DC end of the band.

An ADSL modem organizes the aggregate data stream created by multiplexing downstream channels, duplex channels, and maintenance channels together into blocks, and attaches an error correction code to each block. The receiver then corrects errors that occur during transmission up to the limits implied by the code and the block length.

The unit may, at the user's option, also create "superblocks" by interleaving data within sub-blocks; this allows the receiver to correct any combination of errors within a specific span of bits. Initial trials indicate that the correction used in ADSL will create effective error rates suitable for MPEG2 and other digital video compression schemes.

Who is building ADSL products?

Supporters of ADSL technology include Motorola Semiconductor, Ericsson Austria, AT&T's recently sold Paradyne division and Alcatel Bell. The AT&T Paradyne work is particularly interesting.

In June, AT&T Paradyne released an enhanced version of its ADSL modem technology that it says can achieve transmission speeds over 7 Mbps. At the time, the company predicted that products based on the enhanced technology would enable service providers to offer multiple channels of high-quality video for broadcast and video-on-demand television, and data services over standard phone lines—years ahead of the cable TV companies (many of which will have to retool their existing cable infrastructure first).

Paradyne says this is a commercially viable ADSL transceiver technology that operates at broadband transmission rates that were previously not available with low-cost, low-power technology. Earlier versions of ADSL transceivers were apparently only able to transmit data and video to the user (downstream) at 2 Mbps and 64Kbps from the user to the network (upstream). The company is claiming its enhanced GlobeSpan ADSL technology will dramatically increase downstream rates to over 7 Mbps and upstream rates to 640 Kbps.

"Service providers have been looking for practical implementations of ADSL products with transmission rates of 6 Mbps or more for quite some time," said Gabe Torok, general manager of Paradyne's Advanced Transmission Technology Unit when the announcement of this breakthrough was made. "We're pleased to report that our 7 Mbps ADSL technology offers a here-and-now solution to expedite production, using the same proven design as our HDSL, SDSL, and recently announced RADSL transceivers. This incredible 7 Mbps capacity elevates ADSL to new heights, enhancing its capability to deliver multiple interactive video channels, real-time broadcast video, and high-quality picture and voice for video teleconferencing."

Paradyne is further promising that its GlobeSpan 7 Mbps ADSL technology will enable service providers to offer new video and data services cost effectively over existing phone lines without interrupting standard telephone service. ADSL-based products are expected to support interactive TV services, such as video-on-demand and distance learning, real-time broadcasts of news, sports and weather, video teleconferencing, standard ISDN basic rate interface services, Internet access, and remote connections to corporate networks and intranets.

"By design, ADSL enables a standard phone line to be used simultaneously for a phone call and for video or data services," explained Clete Gardenhour, director of business development for Paradyne's Advanced Transmission Technology Unit. "By increasing the transmission capacity of that line with our new GlobeSpan technology, we've just doubled, tripled, or even quadrupled its value for consumers."

To demonstrate the added value for those who will sell this technology, Gardenhour offered this example: "Imagine Dad on a business call while the youngest child watches a favorite video-on-demand educational program, and Mom is on a video teleconference call with friends, while the teenagers are doing homework assignments using the Internet—all utilizing the same phone line simultaneously. The possibilities are endless, and we expect to see a variety of exciting new applications created by innovative service and content providers in the near future," he predicted.

Prices, however, are harder to predict. Paradyne says consumer pricing for ADSL products and services will be established by equipment manufacturers and service providers as they begin offering new high bandwidth services.

Licensees span the globe

Paradyne's GlobeSpan existing licensees include Advanced Video Access, Cayman Systems Inc., Diamond Lane Communications Corp., General DataComm Inc., Netspeed Inc., PairGain Technologies Inc., Paradyne Broadband Products, Performance Telecom Corp., Tethys Systems Inc. and Westell (all based in the U.S.), plus C-Com of Taiwan, Korean-based Hyundai Electronics Industries Co. Ltd., LG Information & Communication Ltd. and Il-Jin Telecom Electronics Co., Ltd., Italy's IPM Datacom and Selta S.P.A., Australia's NEC Australia Pty Ltd., Nokia Telecommunications of Finland, Parks Informatica of Brazil, Swiss-based Schmid Telecom and Team Accountants Sdn. Bhd. of Malaysia.

Since these announcements, Paradyne has been sold to Texas Pacific Group for US$175 million and it is not yet clear how the sale will impact the company's ADSL products, although AT&T spinoff company Lucent Technologies (the parent from which Paradyne was actually sold) and Texas Pacific have signed an agreement under which Paradyne will be a preferred supplier of network access products for Lucent.

Meanwhile, telecommunications giant Motorola is moving into the ADSL market with lots of partnership agreements. In April, for example, Motorola and Amati Communications announced a strategic alliance to deliver "cost-effective, standards-based ADSL solutions for interactive multimedia via plain old telephone service (POTS) lines."

Amati has licensed its Discrete Multi Tone (DMT) line-code technology to Motorola. Motorola will couple DMT with its mixed-signal expertise and its 0.5 micron CMOS technology to design an integrated single-chip solution that it says will drive the cost of an ADSL line down to several hundred dollars.

Until now only 1.5-to-2 Mbps ADSL systems

Continued on page **23**

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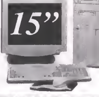

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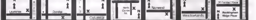

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ADSL

Continued from page **20**

have been available. Motorola and Amati say this alliance will capitalize on the expertise of both companies to develop ADSL technology capable of delivering up to 6 Mbps downstream and up to 640 Kbps bi-directionally

Motorola is pledging to introduce its standard compliant single chip ADSL solution to the market later this year. "Motorola's goal is to deliver a single chip for less than $90 in production volumes," said Debbie Sallee, communications strategic planner for Motorola's MOS Digital-Analog I C. Division "This will allow our customers to meet the industry's targeted cost per line for interactive multimedia services."

Amati is not the only partner Motorola has signed up in the battle to move to ADSL. Illinois-based Westell announced in July that it was entering into an alliance with Motorola for the development of modems that use ADSL technology

"The near-term societal impact of this technology will be phenomenal," said J W Nelson, Westell's president of U.S operations "The communications landscape will look radically different in just a few years, which will greatly benefit everyone "

Westell, which claims to have developed the first ADSL modem and have the leading market share worldwide, will incorporate Motorola's standards-based DMT transceiver chip called CopperGold, into its modems and systems. In addition, the two companies will collaborate on product design and development of future-generation ADSL-based semiconductors, modems and systems

These integrated transceivers support both STM (synchronous transfer mode) and ATM (asynchronous transfer mode) transmission speeds up to 8 Mbps, which is about 600 times faster than with today's common, 14 400 bit-per-second (bps) modems. Westell says the scaleable DMT architecture supports a range of transmission speeds from 32 000[w1] bps to 8Mbps from the network provider to the customer and 32,000 bps to 1Mbps from the customer to the network provider.

"Several telecommunications service providers have stated their desires to implement standards-based DMT solutions for their DSL services," said Rob Faw, Westell's president of global operations "Our alliance with Motorola is intended to meet those customers' requirements "

Westell was also behind the development in June of what it claims is the first secure, Plug and Play ADSL PC modem card. Westell's new FlexCap PC card modem which is being used by UUNET Canada in the world's first ADSL trial by an Internet service provider will enable rapid rate video and data applications that are not possible with current modems.

The initial product is scheduled for what Westell calls a "controlled introduction" to phone companies Internet service providers (ISPs) and customers during this summer, with general availability set for later this year. For consumers to take advantage of the benefits of the FlexCap modem, phone companies and ISPs will also need to deploy ADSL technologies in their networks. When they do, the modem promises to provide 1 5 Mbps speeds from the network to the customer and 64Kbps from the user's location to the service provider. The company admits however that the success of Westell's FlexCap modem will be dependent on consumer demand for ADSL modems and other high-speed communications technologies

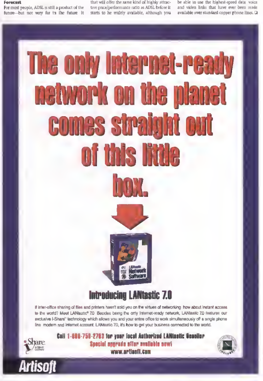
The modem also offers software (developed by Canadian software company MediaLight, Inc) that includes encryption user authentication, enhanced communications and routing protocol that support single users as well as business work groups

Forecast

For most people, ADSL is still a product of the future—but not very far in the future It requires neither the high user cost of ISDN nor the steep infrastructure cost to the world's phone companies. It is virtually certain that, within the next two years many users will be clamoring to get hold of modems that use this technology

On the face of it, there appears little likelihood that anyone will develop anything else that will offer the same kind of highly attractive price/performance ratio as ADSL before it starts to be widely available, although you can expect those with a vested interest in existing ISDN arrangements (as well as the nascent cable modem market) to try very hard.

So watch this technology very carefully keep an eye on the markets where ADSL services are being rolled out to consumers and businesses—and think about how you might be able to use the highest-speed data voice and video links that have ever been made available over standard copper phone lines. ❑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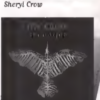

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Net advantage: Increasing accessibility?

BY MICHELLE J. SCHOFFRO

We often hear about the many uses of the Internet in business, marketing, entertainment, and research, but the Net is having other social ramifications that are often overlooked. Many people with disabilities use the Net to do things they might not otherwise be able to do without assistance.

"Some of the new technologies open all kinds of doors and enable people with disabilities to access information in a way they've never been able to do before," says Linda Petty, co-manager of the Adaptive Technology Resource Centre at the University of Toronto. She does note, however, that "some of the latest technologies inhibit access for people with disabilities."

Jo Churcher, Coordinator of Electronic Collections and Special Products at the Canadian National Institute for the Blind, says that the Internet is "tearing down barriers." In usenet or "chat" groups "it's not necessary to say "I'm blind," Churcher says. She adds, "It gives non-disabled participants a simple and comfortable way of learning that blindness and other forms of disabilities don't, in themselves, set people apart from the rest of mankind."

Disabled people benefit from the Internet in many different ways. Churcher says that its uses vary as much as "individual personalities. Some [people] enjoy playing games, pursuing hobbies, conducting business, following and contributing to newsgroups and e-mail lists, and buying and selling." The Internet "gave us [the blind] an opportunity not only to meet other blind Canadians all across the country, but to get acquainted with people who had various disabilities."

Internet independence

People with mobility problems often have a difficult time getting out to meet others and may rely on other people for transportation, or running errands. The Net offers some independence to these people, allowing them to perform many tasks that previously required a great amount of mobility.

Newsgroups, or usenet groups, offer the opportunity for all people to share experiences, learn, get help for problems, support each other, or get professional expertise. Often, many representatives of the companies that manufacture adaptive technologies stay involved in these groups to let people know about upgrades and developments that could potentially make their lives easier. The developments range from artificial limb improvements to voice-driven computer technology designed for the blind.

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YOUR PATH OF LEAST RESISTANCE TO THE INTERNET

Faster translation

The Canadian National Institute for the Blind (CNIB) utilizes the wealth of information available on the Net to supply people with various media, including newspapers, magazines, job postings, encyclopedias, phone books and many general interest books. After accessing material on the Internet, the CNIB forwards it for translation into braille audio or large print format Once that is complete the information is passed on to the CNIB clients.

Before the Internet translating a newspaper into various formats for the visually impaired meant first typing every word into a computer This procedure took several weeks Now it can be done almost instantaneously and with fewer resources. This means a greater number of written materials are available for people with disabilities. They are also no longer reading yesterday's news Thanks in part to the Internet the CNIB is now Canada's largest producer of braille and audio materials

In the digital age many new employment opportunities are available to people who can successfully use a computer. It makes no difference if they can speak, hear or move freely The Internet offers immeasurable research resources that people can reach from a home based computer system People with disabilities can also download their work by modem and return it to an employer via the Net. The Internet helps level the playing field for disabled persons.

As an example, Petty cites the advantages the Internet offers to people with quadriplegia or cerebral palsy It "allows them to access text files, access mail through e-mail access libraries, all through the computer, whereas for the same person to do that physically, they would have to book a mobility bus often one week in advance They would have to get an attendant or a friend or a relative to go with them They would have to get someone to get the book off the shelf They would have to buy a $2 000 page turner to flip the pages and then they would have to laboriously type that text into the computer to acquire the amount of research information for their essay or whatever."

Net disadvantage

Few Web designers consider the needs of people with disabilities Many sites present loads of graphics but no accompanying text descriptions. With text the visually impaired can translate the information into braille or another format, using the appropriate technology

Elaborate sound effects produce a similar problem. Rarely is there an accompanying text read-out of what is said in the audio file. This means that anyone with a hearing impairment or without sound capabilities on their computers misses out on this information

The simple solution—text to accompany or describe graphic and audio files—is offered by few companies or organizations on the Web.

In response to this deficiency, the Canadian Network for the Advancement of Research in Industry and Education is providing funding to SoftQuad, a software company, to develop a Web browser with built in access features It should be available by December 1997

Then there is the problem of the escalating costs of rapidly changing technology Churcher says, "Trying to keep up is unthinkable for most people I think when we talk about these wonderful new developments we tend to forget that some people, in fact, many disabled Canadians are not employed They have very little money to spend and can't consider updating their computers and their equipment each year"

Another difficulty for the visually impaired person is the graphically based Windows environment They have trouble envisioning what Windows are and how to move around within them This is especially true for those with congenital blindness.

As more and more people survive illness or injury and as older people live longer and acquire disabilities, the issue of Internet accessibility will expand But, the Internet is still in its infancy and can be improved

While there is a lot of hype and excitement surrounding the Internet to many disabled people it offers social interaction, work opportunities, friendships, and often, increased independence ❑

Disability issue Web sites

Disabled Peoples' International Home Page • The objective of this organization is to "promote the human rights of people with disabilities through full participation, equalization of opportunity and development."

Contact http://www.dpi.org/indextxt.html

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Contact http://www.utoronto.ca/atrc/

Integrated Network of Disability Information and Education (INDIE) • The objective of this organization is to "maintain a comprehensive directory of Internet-based information resources related to disability.. In French and/or English."
Contact http://www.indie.ca

productABILITY • productABILITY is a consumers organization that supplies information on various products and adaptive technologies for disabled persons The productABILITY Web site part of the TenTen Sinclair Housing Inc site, is currently under construction but the TenTen site is worth a visit for its wealth of information and expertise on independent living.
Contact Brian Everton productABILITY
1010 Sinclair St. Winnipeg Man R2V 3H7
Tel. 800-601-8780 Tel/Fax: 204-338-6606

Web site http://www.tenten.mb.ca

Equal Access to Software and Information (EASI) • EASI provides information about access-to-information technologies by individuals with disabilities
Contact: http://www.rit.edu/~easi/

Evan Kemp Disability Resource Home Page • There are many Internet-related links here
Contact: http://disability.com/cool.html

National Library Service for the Blind and Physically Handicapped • Bibliographies of braille and talking books are available at this site
Contact: http://lcweb.gov/nls/nls.html

NCSA Mosaic Access Page • Learn how people with disabilities can use the Internet and the World Wide Web
Contact http://bucky.aa.uic.edu/

Recording for the Blind and Dyslexic • This is an American non profit organization serving people who cannot read standard print. The site provides information about the group's services and products, which include dictionaries, reference materials and professional books on computer disk (E-Text) and specially adapted tape players/recorders to use with the organization's audio books
Contact http://www.rfb.org/

TRACE Research and Development Centre • The Trace Centre's goal is to improve access to computers and information systems for disabled persons
Contact. http://www.trace.wisc.edu/

WebABLE! • WebABLE's promotes the interests of adaptive, assistive and access technology researchers, users and manufacturers
Contact http://www.webable.com/

Ability Online • This is not a Web site, but it has some useful services Ability Online is a computerized network that connects disabled and chronically ill kids and their families.
Contact Ability Online 919 Alness St North York Ont. M3J 2J1 Tel. 416-650-6207
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Canada's SchoolNet leads the world

BY MICHELLE J. SCHOFFRO

Canada is taking the lead in educational use of the Internet. Already over half of all Canadian schools are connected to the Net and SchoolNet expects the rest to be online by the end of the year. No other country is close to that level of connectivity.

Canada's SchoolNet is an educational initiative supported by a variety of organizations across Canada, from government agencies—provincial, territorial and federal—to the information technology industry and educational establishments. The coalition's mandate is to facilitate excellence in learning through electronic networking across the country.

"It's very exciting to see what's going on here in Canada ... in a number of areas," said Microsoft chief Bill Gates during a visit to Ontario earlier this year. "SchoolNet is the leading program in the world in terms of letting kids get out and use computers."

SchoolNet/Stentor partnership

A partnership between SchoolNet and Stentor (the alliance of Canada's major telephone companies) offers all Canadian schools affordable high-speed Internet access by the end of the 1996/97 school year.

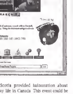
Stentor agreed to make two satellite channels available at no cost for two years. Telesat Canada's DirecPC technology supports these channels. When completed, this agreement positions Canada as the first country in the world to connect all of its schools to the information highway.

Through this partnership, SchoolNet will also be able to provide affordable options for rural and remote schools—options that Byron James, chair of the SchoolNet National Advisory Board (SNAB) says, are "an exciting educational opportunity ... It means that every Canadian student, regardless of her or his location, will have the means to access the best educational content from all over the world."

With the program, students and teachers, no matter where they live, will be able to communicate with each other and collaborate on common projects.

SchoolNet plays an important role in teaching students the skills necessary to access information over the Internet enhancing educational opportunities at both the elementary and secondary levels. It is a primary access point for an increasing variety of resources.

SchoolNet now provides links to libraries, galleries and museums across Canada and around the globe, offers the opportunity to view digitized collections and gives global access to more than 400 scientists, engineers and advisers.



SchoolNet GrassRoots projects

SchoolNet funds innovative teacher-designed networking projects through its GrassRoots Project. Projects are built around the Internet and topics students are currently learning in the classroom while using community, business and scientific resources to challenge and create information-processing and problem-solving skills. Students access up-to-date information, and share it with other classes on the Internet. The GrassRoots Project also aims to provide a forum to stimulate widespread educational use of Internet-based resources.

SchoolNet goes global

SchoolNet showcased its wares at INET 96 (the first time the International Annual Meeting of the Internet Society has been held in Canada) in Montreal. Numerous issues came to the forefront at the show, including who will build a global school house, how will it be implemented, and how can it become accessible.

Industry Canada Minister John Manley praised the SchoolNet initiatives at the INET'96 meeting. "Thanks to the help of the private sector, we expect that all Canadian schools will be online by 1997."

He noted that the SchoolNet Web site receives about 1.5 million hits a month and "the program has been so successful that the adults in many towns and remote communities have asked for a similar program to help them get hooked up."

SchoolNet's international profile was raised again at the G-7 (a group formed by members of the leading industrialized democracies) Information Society and Development meeting in Johannesburg. At the meeting, a contract between Canada and South Africa was initiated to advance education, electronic learning technologies, and distance learning. And as part of the agreement, the High Commission of South Africa linked its Web site to SchoolNet providing information about South African culture, politics, history, geography, and tourism, as well as links to other South African Web sites.

A recent SchoolNet project involved a video conference bringing together students from Parktown Boys' High School in South Africa and students from Auburn Drive High School in Nova Scotia. The South African students shared their research on the history of democracy in South Africa while students in Nova Scotia provided information about everyday life in Canada. This event could be the beginning of future co-operation between the two schools, a permanent reminder of how technology can contribute to education around the world.

Industry Canada also began to advance educational networking, distance education and electronic learning technologies through an agreement with the New Zealand ministry of education. A joint contribution of knowledge and resources allows a larger community of education providers and users to contribute diverse perspectives and encourages discussion of ideas, methods and technology.

Industry Canada's initiatives include involving New Zealand schools in various SchoolNet services, particularly online classroom projects and educator and learner discussion groups, sharing educational and technology assessments, and encouraging partnerships between First Nations schools in Canada and Indigenous schools in New Zealand. Industry Canada's Computers for Schools program serves as a model that may facilitate the development of a similar program in New Zealand.

That country's ministry of education will organize forums for teachers on selected topics. For example, a game called *Trading Places* teaches students about the dynamics of global trading, nuclear issues and environmental topics. The Internet via SchoolNet is a medium well-suited for learning. The support network and "pedagogically sound" classroom project options provide a school-related opportunity to extend beyond traditional methods of learning.

Recently Thailand, France, Spain, Sweden, Trinidad and Tobago also expressed their enthusiasm for SchoolNet and their desire to learn from its model.

The tremendous response from outside Canada has prompted a study on the future of SchoolNet in the international community. It will be announced later this fall. ❑

Contact: SchoolNet. Web site: http://www.schoolnet.ca

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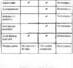
The 6x86 family, available in P120+, P150+, P166+ and P200+ models, are labeled with the new industry accepted "P-rating" system, which allow end users to evaluate microprocessors on relative performance levels, not just clock speed.

So when it comes time to decide on which CPU is right for you, take a little time to do your homework.



[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		✓	[illegible]
Superscalar	✓	✓	Performance
Superpipelined		✓	Performance
Multi-branch prediction		✓	Performance
Multi-branch prediction		✓	Performance
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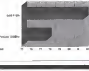
Winstone 96 with Windows 95 Results



*Results confirmed with MDR Labs, "Performance Analysis of the 6x86" January 1996

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Dream machines

Pentium Pro
Pentium Pros and other things in English racing green
and other things in English racing green

BY CHRIS FISHER, STEVE HALINDA & TIM BINGHAM WALLIS

Speed, it seems to me, provides the one genuinely modern pleasure

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Materialistically speaking, my wish list isn't that long. Catch is, the items on it are big tickets and reside somewhere in the future.

At the top of the list is a cottage on a lake where the fishing is exceptional. Next comes one of those new sporty Volvo's in English racing green. The third item is—and this is where we'll get on topic—a dual-processing Pentium Pro with at least 100 MB of RAM and several gigabytes of hard-disk space.

In short, I desire a computer with a configuration similar to many of the ones we look at in this month's survey. Sure, we get the machines for a while and we test, inspect, fiddle and work on them, but sooner or later, loan periods expire and back they go. There is a big difference between testing something and integrating it into your everyday life. This month, having spoiled ourselves with the pinnacle of what the X86 architecture has to offer for the desktop, we will be particularly sad to see them go.

At last, we test the Pentium Pro

This is the first time that *The Computer Paper* Test Lab has had a serious look at machines based on the Pentium Pro processor. This is by no means due to a lack of enthusiasm for this cutting edge generation of microprocessors from Intel. Rather, the decision to hold off on reviewing systems based on the Pentium Pro was more calculated.

We chose to wait until the processor became a more viable mainstream alternative. Pricing, availability and operating system issues have, for the most part, kept the Pentium Pro just out reach of the average computer user.

Now, as we see Microsoft's imminent release of Windows NT4.0 (which is perhaps best characterized as a robust true 32-bit operating system with a friendly face) and IBM's release of Merlin, the next generation of OS/2 (which is perhaps best characterized as a robust true 32-bit operating system with a friendly face and ears), we don't have to rub the crystal ball too hard to predict that sales of the Pentium Pro are about to go through the roof. The processor and the technology surrounding it are about to start filtering into wider consumer markets.

Since Intel started releasing information on the Pentium Pro's inner workings, the differences between the Pentium Pro and the plain old Pentium processor have generated thousands of reports and magazine articles filled with high falutin' language. Many of you are well aware by now of the differences, advantages and drawbacks of the Pentium Pro processor.

However, for those of you trying to make a decision between a Pentium or a Pentium Pro machine—at the risk of beating the topic to death—we'll try to cover this material in a palatable format. Developments in supporting architecture and operating systems dictate that we spend some time here discussing the

Continued on page **35**

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nuts and bolts of Pentium Pro technology and 32-bit operating systems.

Pentium Pro—so what?

The Pentium Pro is Intel's latest family of processors which includes significant architectural enhancements over the traditional Pentium processor.

How impressive is it? The United States Department of Energy selected Intel to build a new computer that will deliver 10 times the performance of today's fastest supercomputer. Due to be installed at the end of this year, the system is being developed around more than 9,000 Pentium Pro processors. It will be the world's first computer with the ability to calculate more than a trillion operations per second.

How fast is that? Well, according to Intel in the time it takes a bullet to travel one foot, the computer could complete 667 million calculations—that's about 40 billion calculations in the blink of an eye.

The exciting part, as Andrew Grove puts it is that "we can create a system 10 times more powerful than the fastest supercomputer in the world today using the same chips we're putting in desktop PCs."

Scalability was a design feature of the processor right from the start. The completion of the Department of Energy computer will serve as a testament to how well Intel did the job.

Optimized for 32 bit environments

The improvements are however only truly apparent in a 32 bit environment. Paradoxically the chip's higher price aside, some of the improvements in the Pentium Pro are also its greatest impediment to widespread adoption.

While the microprocessor offers far superior performance over any of its x86 counterparts in 32-bit environments, when running 16-bit applications and operating systems, the processor can only muster performance similar to and even lower than a vanilla Pentium CPU at the same clock speed.

The story goes that when Intel started working on the P6 at the start of this decade they predicted that when it was finished, 32-bit operating systems would be the standard fare, and thus, they designed the Pentium Pro specifically to take advantage of this environment.

A 32-bit operating system manages data, program code and program addressing information in 32 bit wide words. Likewise computers have been 32-bit since the introduction of the 386DX. Knowing this perhaps makes it easier to understand why the Pentium Pro microprocessor performs less than optimally in a 16-bit software environment.

The main problem is due to something called branch prediction. Basically this means that the processor works ahead guessing at what instructions it will need to execute next. It performs these operations and processes other instructions simultaneously.

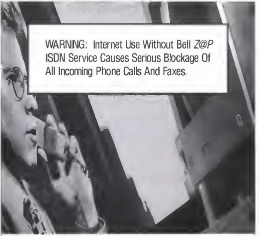
The problem is that when the branch prediction is wrong the processor stalls and some of the work in progress in the processor needs to be done again. Considering that a microprocessor only sees a series of 1's and 0's, it is easy to imagine that 16-bit code and 32-bit code cannot be treated as birds of a feather when it comes to designing algorithms to act upon them. A sacrifice had to be made and 16-bit optimizations were the obvious choice.

Despite the processor's lackluster performance using 16-bit code things have worked out quite nicely for Intel. The clear difference in product positioning has enabled them to continue milking their "cash cow," Pentium processors. While refining supporting architectures and manufacturing of the Pentium Pro Intel has thus far managed to avoid any significant self-cannibalization between the processor lines.

Once a critical mass of drivers has been developed for the latest crop of slick 32-bit operating systems, it's easy to speculate (with emphasis on speculate) that Intel will drop the price on Pentium Pros and blow them out the door.

The architecture of the Pentium Pro is far advanced over that of the Pentium processor. It has a 12-stage superpipelined structure; the Pentium only uses a five-stage process. Pipelining is a term used to describe the way a processor divides an instruction into sequential steps using different resources of the microprocessor at each step. The stages of pipelining in the Pentium Pro take less time and do less work than those of the Pentium. The pipestage process time is reduced by 33 percent in the Pentium Pro, which has profound implications for the manufacturing process. A Pentium Pro processor can have a clock speed 33 percent faster than a Pentium processor without being any harder to manufacture.

Between the fetch and execute phases of the instruction cycle, the processor also has the ability to look ahead in the code to find instructions that will utilize the CPU's ➤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time most effectively. Typically the processor looks 20 to 30 instructions ahead of its current instruction.

Naturally the processor stores the results of out-of-order instructions and supplies them when the program counter signifies a result is required. This out-of-order instruction is part of a larger process known as dynamic execution. Dynamic execution is the combination of three processes: multiple branch prediction, where the processor looks ahead multiple steps to predict what is likely to be processed next; dataflow analysis, which is the analysis of dependencies between instructions; and speculative execution, which uses the optimized execution schedule produced by dataflow analysis to speculatively carry out instructions to keep the processor's superscaler architecture continually busy.

One of the fundamental problems in microcomputer architecture that this process solves is memory latency. Over the last 10 years CPU speeds have increased tenfold, but the speed of main memory has increased by only 60 percent. This means that, in many cases, a CPU's processing power is not being fully utilized as it is stalled waiting for instructions to come in from memory. Using dynamic execution, the Pentium Pro is able to keep itself busy while waiting for additional instructions from memory.

Another innovation of the Pentium Pro processor is the inclusion of a Level-2 cache on the chip. The first rendition of the chip included a 256KB cache, but Intel has recently introduced CPUs which include a 512KB cache, though these are not widely available at the time of this writing.

The Pentium Pro is actually two chips, as the Level-2 cache is a separate chip that is attached to the microprocessor. It is interesting to note that while the CPU component of the Pentium Pro is made up of 5.5 million transistors, the 256KB of Level-2 cache contains 15.5 million transistors, bringing the grand total to 21 million—which all adds up to a very large schematic diagram.

Having the cache on the processor has two distinct advantages. Firstly, it makes it easier and cheaper for system designers to integrate the processor into motherboards. Secondly, it allows for increased performance. This comes from the fact that the cache is connected to the CPU core by a 64-bit wide bus that runs at the same clock speed as the CPU.

Caches implemented on motherboards are tied to the system bus speed (typically 60 or 66 MHz), which cannot supply the processor with data any faster. For the Pentium Pro, waiting for the cache is eliminated.

In addition, the Level-2 cache on the Pentium Pro is non-blocking, meaning that when information is moved over the bus, the processor is not stalled, nor are subsequent bus transactions, as is the case in a Pentium that uses a clock divider to wait for the appropriate time to take information from the system bus. This arrangement is critical to the processor's performance as it is the Level 2 cache that keeps a processor fed with instructions.

We've mentioned this before, but it bears repeating: no matter what kind of system you are looking at, never buy a computer without a Level-2 cache.

32 bit OSes get revamped

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Continued on page 40

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- 1.44 MB Panasonic Floppy Drive
- US Robotics 33.6 int Fax/Modem/Voice
- Sound Blaster 32 Wave & 3D Sound
- Labtec CS-180 Speakers & Microphone
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Processor (MHz)	Pentium Pro 200	Pentium Pro 200	Pentium Pro 200	Pentium Pro 200	Dual P Pro 200	Pentium Pro 200	Pentium Pro 200	Pentium Pro 200
Chip set	Intel 440FX	Intel 450KX	Intel 440FX	Intel 440FX	Intel 440FX	Intel 440FX	Intel 450KX	Intel 450KX
Cache size	256K	256K	256K	256K	256K	256K	256K	256K
RAM	32 MB EDO	32 MB EDO	32 MB EDO	32 MB EDO	128 MB	64 MB EDO	64 MB EDO	32 MB EDO
Video card	Matrox Millennium	S3 Trio 64	Matrox Millennium	Diamond Stealth	Winfast 3D L2500	#9 Imagine II	Matrox Millennium	Matrox Millennium
Video memory	2 MB WRAM	2 MB EDO	4 MB WRAM	2 MB EDO	16 MB	4 MB VRAM	4 MB WRAM	4 MB WRAM
Monitor	None	None	None	None	None	Ultrascan 17HS Trinitron	Viewsonic PT-810	None
Sound card	Crystal 16-bit	Acer S22	None	None	None	None	SB AWE 32	SB AWE 32
Hard drive	Western Digital 2.3 GB EIDE	Western Digital 2.5 GB EIDE	Seagate Barracuda 4.2 GB SCSI	Western Digital 1.6 GB EIDE	Seagate 2.1 GB SCSI	IBM 3.2 GB EIDE	Seagate 4.2 GB SCSI	Quantum 4.3 GB SCSI
SCSI card	None	None	Adaptec 2940UW	None	Adaptec 2940UW	None	Adaptec 3940U	Wide caching w/1 MB EDO
CD-ROM drive	8x	Acer 8x	Panasonic 8x	Toshiba 8x	Toshiba 8x	Sony 8x	Mitsumi 8x	Acer 10x
System BIOS	AMI	Award	Award	AMI	AMI	AMI	Award	Award
Plug and Play support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Operating system	Windows NT 3.51	Windows NT 3.51	Windows NT 4.0b2	Windows NT 4.0	Windows NT 4.0	Windows NT 4.0	Windows NT 3.51	Windows NT 3.51
Extras			PCI 10Base-T Ethernet				Speakers, HP Sure Store USR 28.8 DSVD Iomega Easy800	Speakers Creative Labs 33.6K
Windows Benchmarks								
Desktop publishing	139	178	160	211	265	333	265	273
Desktop graphics	258	259	315	294	297	325	279	278
Desktop presentation	205	134	259	150	321	236	256	239
Word processing	126	134	166	163	237	277	203	202
Spreadsheet	139	137	175	189	261	261	185	186
Database	125	156	136	174	207	240	237	231
Sysmark 32	150	142	159	184	258	274	221	214
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PENTIUM PRO SURVEY

	Hewlett Packard Vectra XA	Micro Infiniti	Millennium	Mycomp Vantage	OA Comp	Sirus	STD CompuPartner	Ultinet
Processor (MHz)	Pentium Pro 200	Pentium Pro 200	Dual Pentium Pro 200	Pentium Pro 200	Pentium Pro 200	Pentium Pro 200	Pentium Pro 200	Pentium Pro 200
Chip set	Intel 440FX	Intel 450KX	Intel 440FX	Intel 440FX	Intel 440FX	Intel 440FX	Intel 450KX	Intel 440FX
Cache size	256K	256K	256K	256K	256K	256K	256K	256K
RAM	64 MB	32 MB EDO	128 MB EDO	32 MB EDO	32 MB EDO	32 MB EDO	32 MB EDO	64 MB EDO
Video card	Matrox Millennium	ATI Mach 64	Matrox Millennium	Matrox Millennium	Matrox Millennium	Diamond Stealth 64	ATI Mach 64	Matrox Millennium
Video memory	2 MB WRAM	4 MB VRAM	2 MB WRAM	2 MB WRAM	4 MB WRAM	2 MB EDO	2 MB VRAM	2 MB WRAM
Monitor	None	None	None	None	None	VDO 17-inch	None	None
Sound card	SB 16	SB 32	SB 16	ESS 1688	SB AWE 32	SB 32	None	SB 32
Hard drive	Quantum 2.3 GB EIDE	Quantum [illegible] 2.1 GB SCSI	Quantum 2.0 GB SCSI	Quantum 1.7 GB EIDE	Seagate 2.0 GB SCSI	Quantum 2.0 GB SCSI	Seagate 2.0 GB SCSI	Seagate 2.1 GB EIDE
SCSI card	None	Adaptec 2940W	Adaptec 2940UW	None	Adaptec 2940UW	Adaptec 2940UW	Adaptec 2940	None
CD-ROM drive	8x	Mitsumi 8x	Plextor 8x SCSI	BTC 8x	Acer 8x	4x SCSI	Toshiba 4x SCSI	Acer 8x
System BIOS	Phoenix	Award	Award	Award	Award	AMI	AMI	Award
Plug and Play support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Operating system	Windows NT 3.51	Windows NT 3.51	Windows NT 4.0b2	Windows NT 3.51	Windows NT 3.51	Windows NT 4.0b2	Windows NT 3.51	Windows NT 3.51
Extras		USR 28.8K		Speakers	Speakers Iomega Insider Jazz 1 GB USR 28.8 faxmodem			Speakers
Windows benchmarks								
Desktop publishing	273	130	159	206	257	136	197	217
Desktop graphics	283	253	276	260	281	310	257	272
Desktop presentation	240	187	217	197	259	258	193	219
Word processing	136	110	185	159	207	149	158	178
Spreadsheet	169	122	177	187	181	187	152	172
Database	245	N/A	126	188	239	162	168	206
Sysmark 32	215	N/A	174	179	222	190	170	194
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Suggested retail price	$3,975*	$4,319	$6,177	$3,995	$5,968	$5,190	$2,999	$3,250
Warranty	3 years	2 years	3 years	3 years	1 year	2 years	2 years	2 years

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Dream machines

Continued from page ***36***

ating systems at the commercial level IBM with OS/2 and Microsoft with Windows NT have both been hard at work producing newer, more attractive versions of their systems

Microsoft has already released gold code of its systems to the industry and IBM's OS/2 Merlin should be available by the time you read this. Both systems are architecturally similar to their predecessors but have gone through a number of refinements

With Merlin, IBM has worked to make the user interface more intuitive and user friendly IBM has also added voice recognition which comes out of the company's 37 year commitment to research and development in speech-recognition technology

Other enhancements offer better system management, and integrated Java technology OS/2 can reap significant performance gains from the Pentium Pro According to IBM, the increase is between 30 and 121 per cent over a standard Pentium processor running at the same clock speed

Windows 95 with a Pentium Pro?

Windows 95 uses a significant amount of 16-bit code. Microsoft bashers all over have criticized the operating system greatly for this

However the use of this code, a lot of which is found in the graphics subsystem is, for the most part, to maintain a good level of compatibility with existing 16-bit software Certainly NT will run a lot of 16-bit applications, but the performance hit is quite large

There would have been far more critics had Microsoft released Windows 95 without the ability to run popular games and likely a much lower sales volume To test the performance differences between Windows 95 and Windows NT we benchmarked both operating systems on the same machine (the one supplied by Sirus) The difference between the processor running Windows NT 4 0 beta 2 and Windows 95 turned out to be quite slim with NT having the edge by about three percent

This suggests that either (or both) of the following beliefs are overrated "Pentium Pro's performance on 16-bit applications is poor" or "Windows 95 has too much 16 bit code " It doesn't seem unreasonable, despite conventional wisdom to suggest that Windows 95 and the Pentium Pro make a good partnership.

Windows NT 4 0 vs NT 3.51

Microsoft's official claim is as follows "Preliminary tests show an average increase of 18 and 21 percent in the performance of today's 32-bit desktop business applications when running Windows NT 4 0 on Pentium Pro and Pentium processor based computer systems, respectively as compared with the identical applications and systems running on Windows NT 3 51 "

Our tests tell a slightly different story We ran BAPCo's Sysmark 32 on one of the machines from Comtex using the release version of Windows NT 4 0 and Windows NT 3 51. The overall score (or Sysmark) for the system running under NT 4 0 was 205 and under NT 3 51 it was 184 This is a significant increase to be sure but much closer to 10 per cent, in contrast to Microsoft's claim of 18 to 21 percent.

Please take note that the machines in the table were benchmarked under differing versions of Microsoft's new operating system. For the machines that ran under Windows NT 3 51 you will want to increase the score by approximately 10 percent to get a better idea of the relative performance of the machines

Note that we also ran a similar test on the Dell system. This time our focus was on the performance differences between NT 4 0b2 (beta) and the 4 0 (final release) version Our tests indicate that there was virtually no difference in the final scores with a Sysmark of 274 under the 4 0 release and 273 under 4 0b2 All of the testing was done with resolutions of 1024x768 at 256 colors Where Windows NT systems are concerned all were configured using the file allocation table (FAT) system

PCIsets

There are a number of different chip sets (known as PCIsets) available for the Pentium Pro. PCIsets are the chips located on the motherboard that provide the logic to "glue" the processor to other parts of the system such as memory and buses.

The first generation of PCIsets that Intel introduced for the Pentium Pro were the 450KX and the 450GX The GX chips are designed for Pentium Pro processor servers for performance and upgradability through multiprocessing

Features of this PCIset include quad dual and single processor support and scalable memory (up to four way interleaved) scalable primary PCI buses and memory support up to

Continued on page ***42***

INTEL TRITON VX-3 PCI Pentium

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Sirus Pentium 166
The Computer Paper
March 1996

Sirus Pentium 133
The Computer Paper
June 1996

If you thought your only choice when it comes to computers was between IBM or Mac, think again. Sirus' own **Pentium 133 and Pentium 166 were recently named best performers by the Computer Paper Magazine.**

Era-Banner Business News August 1996

...the Pentium 133 from Sirus is a clear choice. This machine runs faster than any Pentium 133 we've seen to date and even outdoes some 150 and 166 MHz Pentium based machines. This system is a scorcher ... **the fastest 133 MHz Pentium money can buy.** We've seen a lot of combinations ... **This one is the best yet.**

The Computer Paper June 1996

For speed and features and bags of quality components, the systems from Sirus are clear choices. **The specification sheets for these PCs read like a who's who of the computer industry.** Sirus is one outfit that has the speed aspect of PCs down pat. This time its machine was again among the fastest of the bunch.

The Computer Paper March 1996

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The Computer Paper October 1995

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Dream machines

*Continued from page **40***

4 GB The 450KX was designed for workstations but has recently been given a face lift in the form of the 440FX PCIset that supports 512 MB of memory per processor and offers several enhancements over the 450KX set including CPU to DRAM pipelining, I/O queuing, write burst combining, dynamic deferring, Concurrent PCI, PCI 2.1, Bus Master IDE, USB, ECC/Parity, two processor option with I/O Advanced Programmable Interrupt Controller (IO APIC)

In short, if you're looking for a scalable multiprocessing server for your corporation, you'll be getting the GX PCIset. If you are buying a Pentium Pro workstation, departmental or smaller server you'll want to get a system with the newer 440FX chip set.

We're often accused of not comparing apples with apples. For example when we looked at systems for students in the September issue of *The Computer Paper*, we included machines that were rated at significantly different speeds (Pentium 100's, 120's, 133's, and even Cyrix 150+)

Vendors have been known to get extremely upset at us for this kind of practice and from their standpoint, rightly so Their products are not being held up for comparison with systems that match in terms of market positioning and specifications.

However, it can be more educational for readers and shoppers if we include a variety of systems as this allows us to expose more information on the differences between system configurations and what different price points have to offer. Sure, performances vary widely, but people can see different machines for different needs and budgets This month, however, we've gone too far.

We asked vendors to send in high-end system configurations. As a bare minimum, we requested Pentium 200 MHz systems with 32 MB of RAM We also welcomed Pentium Pro-based systems with whatever esoteric peripherals the vendor had to offer We got what we asked for alright from base configured Pentium 200's right through to a dual-processing Pentium Pro 200 with 128 MB of RAM This and a whole lot more

Adding to the complexity of the situation, the systems were benchmarked using a variety of different versions of Windows NT and even Windows 95 This makes it difficult to look at the machines comparatively but with a general idea of the performance differences across different platforms, it is still possible to get a handle on the relative performances offered by the different machines

So without further ado, here they are, the dream machines

AST Bravo MS T 6200

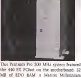
The AST Bravo isn't the most competitive machine on the performance side of things, but for a brand name system it has a low price tag. The Pentium Pro 200 MHz, MS-T 6200 system comes with 32 MB of EDO RAM, a Matrox Millennium video card with 2 MB of WRAM and a 2.3 GB Western Digital EIDE hard drive It uses an 8x CD-ROM drive and a Crystal 16-bit sound card. The system price of $4,300 includes a copy of Windows NT. AST targets this Bravo as a corporate desktop

Comtronic A Open

The A-Open Pentium Pro 200 MHz system from Comtronic featured 32 MB of EDO RAM, an S3 Trio with 2 MB of EDO video RAM, and a Western Digital 2.5 GB EIDE drive Peripheral to these main components the machine was equipped with an Acer S22 sound card and an Acer 8x CD-ROM drive

Relatively speaking, the performance of the A-Open was lacking. We would speculate that the full power of the system was held back somewhat by a slower video subsystem This system came with the Acer AP61 motherboard, which has the 450KX chip set. Acer Open Pentium Pro systems can also be purchased with the 440 FX PCIset using the AP65 motherboard.

Compucon



This Pentium Pro 200 MHz system featured the 440 FX PCIset on the motherboard 32 MB of EDO RAM a Matrox Millennium graphics card with 4 MB of WRAM, an Adaptec 2940 ultra wide SCSI controller hooked to a Seagate Barracuda 4.2 GB hard drive, an 8x Panasonic CD-ROM drive and a PCI full duplex 10BaseT card The system offers good performance for under $5 000 arrived sporting a beta 2 copy of Windows NT4.0 and will be shipping with the real McCoy by the time you read this

Comtex Super Server
Comtex Winpac95 DNE

The Super Server as this machine is affectionately known, was the cause of great excite-

*Continued on page **44***

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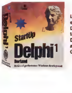

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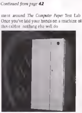
Dream machines

Continued from page **42**

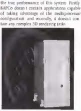
ment around *The Computer Paper* Test Lab Once you've laid your hands on a machine of this calibre nothing else will do



This dual-processing Pentium Pro 200 MHz machine has nothing but total quality components The system is packaged in a large server case with a dual redundant 300-watt power supply It uses the 440FX PCIset and came with a whopping 128 MB of 60 ns RAM, expandable up to 1 GB EDO RAM SCSI interface is provided by an Adaptec 2940 ultra wide card and storage comes in the form of a 2 GB Seagate in a hot-swapable bay Other goodies include an Intel Pro 100B 10/100TX Fast Ethernet controller and an 8x CD-ROM drive.

The real kicker on this system is its video card which is a Win Fast 3D L2500 that uses a GLINT 500TX 3D processor and a GLINT Delta Geometry Engine to accelerate rendering operations. The card comes with an 8 MB VRAM frame buffer and 8 MB DRAM local buffer This is one serious piece of equipment for high-end design workstations Its inclusion in the system makes calling it a server a bit of a misnomer, as servers are more commonly equipped with low-end graphic cards

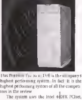
Needless to say, the performance of this system was outstanding outpacing all but one other system with ease Our benchmarks however don't even come close to exposing the true performance of this system Firstly BAPCo doesn't contain applications capable of taking advantage of the multiprocessor configuration and secondly, it doesn't contain any complex 3D rendering tasks



For applications that can properly take advantage of the dual processor in this machine you can expect to see a performance increase somewhere in the order of 50 to 70 percent We watched the system perform some rendering tasks using Vista Pro and all we can say is it was quick. The Comtex Corporate logo is surrounded by the motto "Taking Care of Business," but with products like the Super Server Comtex should consider changing this to 'Taking Care of Business Lightening Quick."

The Comtex Winpac95 is not cut from the same mold as the Super Server It is a single-processing machine on a dual processing motherboard which means that should you require more power down the road you can slip in a second processor It uses the 440FX chip set, comes with 32 MB of EDO RAM expandable to 768 MB uses a Western Digital EIDE hard drive, an 8x CD-ROM drive and an S3 Trio 64 video card This system is priced right at $3 500 and at that price, it is not fair to expect performance that rivals that of the Super Server

Dell Dimension XPS Pro200N



This Pentium Pro from Dell is the company's highest performing system In fact it is the highest performing system of all the competitors in the review

The system uses the Intel 440FX PCIset, has 64 MB of EDO memory a #9 Imagine II video card with 4 MB of VRAM, an IBM 3.2 GB EIDE drive and comes with a Sony 8x CD-ROM drive For a little over $5,000 the system comes with a 17-inch Trinitron monitor and a copy of Windows NT 4 0 This machine is extremely well engineered, and if you want the fastest desktop Pentium Pro computer that money can buy it is the XPS Pro200N from Dell

Delta Micro DRM 200+

This was one of the better performing systems in the survey The dual processing Pentium Pro 200 MHz system is running on a Gigabyte ATX motherboard using the 450KX PCIset. This system is about as richly configured as is possible. The core components are 64 MB of EDO RAM an Adaptec 3940 Ultra SCSI controller a Seagate Fast SCSI-2 4.2 GB hard drive and a Matrox Millennium outfitted with 4 MB of WRAM

Add to this a whole host of top notch peripherals including a Mitsumi 8x CD-ROM drive, a SoundBlaster AWE 32, Altec Lansing ACS 53 speakers with subwoofer and a Viewsonic PT-810 21-inch monitor— which one of our staff members likened to a drive in movie theater screen The list goes on with an HP Surestore CD-writer a USR 28 8Kbps DSVD modem and an Iomega tape backup system On the software side of things Delta throws in Windows NT workstation and MS Office Pro

This is easily one of the most densely configured systems we've ever had pass through our door and all in a mini tower case For a dollar shy of $9 000 Delta Micro throws an OPTI 1000E uninterruptible power supply (UPS) into the deal, which is just the thing

Continued on page **46**

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Dream machines

Continued from page ***44***

you need to protect an investment of this magnitude Delta offers an above average five-year warranty, with three-years on-site service as well as toll-free support Monday through Saturday from 8 a.m. to 8 p.m There is absolutely no question, this is a propeller-head's dream come true.

Express Micro Pro-Series Pentium Pro 200

This Pentium Pro 200 MHz machine came with some very attractive extra features Though the system uses the older 450KX chip set, it still managed to perform well above the average of the systems reviewed. This is perhaps in no small measure attributable to a wide-SCSI caching controller equipped with 8 MB of EDO RAM.

The list of specifications for this system is long and impressive The system was equipped with 32 MB of 70ns EDO RAM, a Quantum 4.3 GB wide SCSI hard drive with a 1 MB cache, a Matrox Millennium 4MB video accelerator, a SoundBlaster 32 Plug and Play sound card, an Acer 10x CD-ROM drive (which, incidentally, is the first 10-speed drive we've seen shipped with a system) and a Creative Labs 33 6Kbps modem. As an option, a Panasonic PD/CD optical rewriteable drive can be added to the system for an extra $700 At $5 600, this computer is not the cheapest to be found; however, given its impressive feature set and an unprecedented warranty of five years labor and three years parts, it is certainly an attractive package.

Hewlett Packard Vectra XA

This performance machine from HP comes with some interesting features not found in other systems in the survey It has enhanced manageability with LAN Remote Power Technology Centralized inventory asset management and advanced security features

The Unit we tested was the 6/200 M2500 version of the machine with a 32 MB upgrade which brought the grand total for RAM up to 64 MB The system uses EIDE for its drives including a Quantum 2 3 GB hard disk and an 8x CD ROM It uses a Matrox Millennium graphics card with 2 MB of WRAM The documentation and support software for this computer are first rate

On the benchmarks the system performed admirably, making it a strong candidate for an editor's choice award in terms of raw performance, but in terms of more value for the dollar, a few of its competitors had the edge

Micro Infinitil

This machine fell victim to shipping damage When we first plugged it in and turned it on we were greeted with nothing Popping open the case revealed that the voltage regulator had come unseated We put the device back in place but remained speculative as to whether this particular AVR is a good fit for the motherboard in this system

We aren't picking on Micro Infinitil because its products are generally of good quality, but this does allow us to illustrate that these things do happen Month after month it never fails that products arrive and do not work Computers are quite fragile internally Undoubtedly many people get new systems to their homes or offices and are met with blank screens or error messages

If this happens to you, don't get excited right away Phone the company that you purchased the equipment from, and they'll replace it. Failures due to shipping are a common and often unavoidable part of doing business with high-tech goods.

The system uses the 450KX chip set, is equipped with 32 MB of EDO, an ATI Mach 64 with 4 MB of VRAM, a SoundBlaster AWE 32, an 8x CD ROM drive, 2940W SCSI controller, and a 2 1 GB Quantum Saturn hard drive Micro Infinitil also throws in a USR 28 8Kbps modem. This system was unable to complete the benchmarks, failing to run the database application—something that has occurred in the past with other machines from various vendors The problem has piqued our interests, but as of yet we are unable to make a definite statement as to where the fault lies

Millennium Dual Pentium Pro 200

This Dual Pentium Pro test system arrived at the Test Lab with a beta 1 version of NT 4 0. Sysmark 32 was unable to operate in this environment due to differences in the printing subsystem We upgraded the system to beta 2, and ran our tests.

As noted previously, BAPCo uses a set of

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standard 32-bit business applications to test the performance of a machine and as such, it cannot give a good indication of a multiprocessing system. At best, you can consider that the benchmark is exploiting part of the machine's multiprocessing capability.

The dual system uses the 440FX chip set came with 128 MB of EDO RAM, an Adaptec 2940UW controller hooked to a Quantum Atlas 2.0 GB SCSI drive, and a Plextor 8x SCSI CD-ROM drive (the Plextor drive is one of very few remaining on the market that must use the CD caddy system). The video system is a Matrox Millennium with 2 MB of WRAM and sound is achieved using a SoundBlaster 16 Plug and Play card.

Given the system's configuration, we were surprised with the score it had achieved. Numerous attempts to tinker with various settings proved to be ineffective.

The Apple among Oranges

Apple Canada's high-performance workstations have clock speeds of up to 200 MHz. However, the 604 processor driving the Power Macintosh 8500, which we received, only had a clock speed of 150 MHz.

(Apple is no longer manufacturing the 8500/150 model, but the company says it is still available.)

The 8500 supports near-broadcast-quality video input/output through a graphic subsystem with a 64-bit data path to 2 MB VRAM. While the base system ships with only 16MB of RAM, it is upgradable to 512 MB.

One of Apple's strongest draws has been ease of networking, and the 8500 is no exception. It includes three PCI expansion cards, two high-speed DMA serial ports, 10Base-T and AAUI-15 Ethernet connectors, an internal fast SCSI bus and an external SCSI bus.

Storage needs are met through a 2 GB SCSI hard drive, and a 4x CD-ROM drive.

An optional PC-compatibility card allows the 8500 to run Windows 95 applications. Users can switch between the two environments and share the same resources. In addition, information can be shared between the systems through the clipboard.

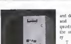
Apple has replaced the 8500/150 with the faster 8500/180, which comes standard with 32 MB of RAM, a 2 GB hard drive, 8x CD-ROM drive, 604E processor. The $6,849 price tag for the 8500/180 does not include a keyboard or monitor.—*Lab Test Editors*

Contact: Apple Canada, Web site:
http://www.apple.ca

Mycomp Vantage

The Mycomp Vantage Pentium Pro 200 came with 32 MB of EDO RAM, a Matrox Millennium video card with 2 MB of WRAM, an ESS 1688 sound card, an 8x CD-ROM drive and a Quantum 1.7 GB EIDE hard disk. The benchmarks for this machine were run under Windows NT 3.51 and the system proved to offer competitive performance in relation to its peers.

OA Comp



One of the better performing systems this month came from OA Comp. This is an extremely well-balanced system that managed to outperform many other systems equipped with far more esoteric components and double and even quadruple the memory.

The Pentium Pro 200 MHz microprocessor is ➤

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supported by the Intel 440FX PCIset came with 32 MB of 60ns EDO RAM a Matrox Millennium video card with 4 MB of DRAM, a SoundBlaster AWE 32, an 8x CD-ROM drive a 2 GB Seagate drive running through an Adaptec 2940 UW SCSI controller. The system came with several extras, including a US Robotics 28.8Kbps modem and an Iomega Insider Jazz backup drive.

Sirus

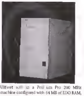
The Pentium Pro 200 system we received this month from Sirus uses the Intel 440FX PCIset and contained 32 MB of 60ns EDO RAM Like several of its peers in this roundup the Sirus system uses Adaptec's 2940 ultra wide SCSI controller and a 2 GB Seagate SCSI hard drive combination Also on the SCSI bus is a 4x CD-ROM drive The video card included on this system was interesting as it was the only system to use the Diamond Stealth 64-bit accelerator equipped with 2 MB of RAM Finishing off the components inside the box is a Creative Labs SoundBlaster 32 The ready to run package includes a 17 inch VDO monitor and Microsoft Windows NT Performance was right around average for this machine and the price is well within the realm of acceptability

STD

The least expensive Pentium Pro system in the round up this bare bones 200 MHz system arrived with 32 MB of EDO RAM, and an

ATI Mach 64 with 2 MB of VRAM Despite the system's low price tag, it still manages to pack a SCSI drive system using a standard Adaptec 2940 controller and a Seagate 2 GB drive. The Toshiba CD-ROM drive though only a 4x, is also chained to the SCSI bus Complete with Windows NT 3.51 the system offers decent, but not top flight, performance for a smidgen less than $3,000

Ultinet



Ultinet sent in a Pentium Pro 200 MHz machine configured with 64 MB of EDO RAM, a Matrox Millennium with 2 MB of WRAM a Creative Labs SoundBlaster 32, a 2.1 Seagate hard drive, an Acer 8x CD-ROM drive, and a 33 6Kbps voice/faxmodem The system is low priced and can be upgraded to allow support for a second processor for an extra $300

Editor's Choices

[illegible] D CompuPartner Pentium Pro 200
[illegible] Dimension XPS Pro200N
Comtex Super Server

Price

STD gets our pick here A bare bones system decent performance and less than $3 000 What more can we say?

All Round

Dell Dimension XPS Pro200 A complete package, fast and inexpensive Nothing else even comes close The HP Vectra XA also deserves mention for building a computer with an eye toward the IS manager.

Power Package

We liked the speed and breadth of accessories that came with Delta Micro's computer. The system from OA Group man[illegible] in performance. This system is well rounded and came close to getting our choice for performance in a single-processor package.

At the end of the day we have two performance champs Comtex's Super Server and the Dell Dimension XPS Pro200. These systems knocked our socks off and we suspect that we will have to wait for the release of some new chip technology from the people in Silicon Valley before we see another system that will outpace them.

The price tag and specifications of the Super Server put it in a league of its own as a high-end design station. The Dell system is quite a different bird, offering amazing performance without too hefty a price tag ❑

NT, Pentium Pro and changing server market

BY GEOF WHEELWRIGHT

The biggest news for all prospective buyers of "network server" computers this year has been the release of Windows NT 4.0, which leading chip maker Intel, claims is going to make a huge difference to the way its processor technology is used in both desktop and server systems.

Intel boasted that NT 4.0 would boost both performance and manageability for business computer systems based on the Pentium Pro and Pentium processors. The company revealed preliminary tests that apparently showed an average increase of 18 and 21 percent, respectively, in the performance of existing 32-bit desktop business applications when running Windows NT 4.0 on Pentium Pro and Pentium processor based computer systems, respectively, as compared with the identical applications and systems running on Windows NT 3.51.

There are also many enhancements in Windows NT 4.0 that take advantage of certain features in the Intel processors that Intel says will also enable server applications to "run faster and improve manageability of servers and desktop systems"

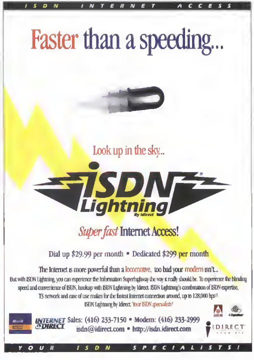
According to Intel, that performance headroom and 32-bit application support, together with improved manageability features in both the hardware platform and the operating system, should make the combination of Windows NT 4.0 and the Pentium Pro processor "the most flexible and manageable high-performance system for business computing today."

There are also many enhancements in Windows NT 4.0 that take advantage of certain features in the Intel processors that Intel says will also enable server applications to "run faster and improve manageability of servers and desktop systems."

Intel claims that optimizations of the operating system code, for example, have yielded significant performance improvements on software applications, as measured by the SYSmark*32 benchmark (a benchmark designed by the Business Applications Performance Corporation, or BAPCo, an industry consortium of 22 major technology companies, including Microsoft and Intel).

These results were drawn from the company's internal use of the SYSmark32 benchmark suite, comprising eight popular business applications: Adobe PageMaker 6.0, CorelDRAW 6.0, Lotus Freelance 96, Lotus WordPro 96, Microsoft Excel 7.0, Powerpoint 7.0, Word 7.0 and Borland Paradox 7.0.

Intel's testing also found that running Windows 95, a 200 MHz Pentium Pro processor-based system ran the SYSmark32 benchmark 22 percent faster than a comparably equipped 200 MHz Pentium processor based system. When both systems ran Windows NT 4.0, however, the Pentium Pro system was claimed to be 39 percent faster than its Pentium processor based counterpart. Finally, Intel says that the Pentium Pro processor based system with Windows NT 4.0 ran the 32-bit business applications some 61 percent faster than the Pentium processor-based system running Windows 95. ➤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(However, see this month's Lab Test report, where somewhat less dramatic performance increases are reported for various combinations of Windows NT 4.0 vs. 3.51, NT vs Windows 95 and Pentium vs Pentium Pro — Ed)

Other goodies in Windows NT include support of the memory management and manageability features built into the Pentium Pro processor which mean that Windows NT 4.0 uses

- the Pentium Pro processor's Machine Check Architecture to collect and log diagnostic data gathered by the processor. This information can then apparently be used to aid in the management of both servers and desktop systems
- the Memory Type Range Registers to identify the location of the frame buffer of the graphics subsystem. This is used by the Pentium Pro processor to accelerate writes to the frame buffer
- The global page and 4 MB page mechanisms to "significantly reduce overhead of virtual to-physical address mappings." Since this overhead can be significant in servers, these features are therefore claimed to increase server performance although it should be pointed out that 4 MB pages are also supported by the Pentium processor.

Intel competing with itself?

The server market is not the only place where the Pentium Pro is having an impact. Something of an odd battle is shaping up on the desktop, where new versions of the Pentium and Pentium Pro processors are beginning to have some users wondering if the two processors shouldn't switch jobs.

In June, for example, Intel introduced a 200 MHz version of the Pentium processor that could make many users wonder whether it is worth bothering with a Pentium Pro system as a server. Intel is clear, however, that these chips are aimed at the "power premium desktop systems" and that they set the stage for the existing range of 133 and 120 MHz Pentium processors to fill the entry level of Intel's PC processor family throughout the rest of this year.

Intel is hoping that these systems will help boost the overall power of desktop systems and give OEMs, dealers and VARs a way to differentiate and add value. "System manufacturers will be offering customers an unprecedented level of performance and value," boasted Carl Everett, Intel's senior vice president of the company's Desktop Products Group.

He even expected the home market segment to benefit from this higher performance in the Pentium processor family, perhaps using Intel's recently launched Video Phone (using the company's with ProShare technology which allows callers to view each other on PCs using standard telephone lines).

Despite these innovative possibilities, Intel is clear that it does not want the 200 MHz Pentium processor to compete with the Pentium Pro is the server sector. It says that although it expects these high-speed Pentium processors will continue to be the choice for users of Windows 95, it predicts that business users will continue to move other 32-bit software environments (such as Windows NT and UNIX) and use selecting Pentium Pro systems.

The supporting cast of chipsets

But there appears to be a possible conflict brewing on the desktop with Intel's launch in May of the 440FX chip set, new desktop management software and a new series of motherboards that were supposed to round out the Pentium Pro processor platform building blocks designed for system manufacturers. Intel expects users of these motherboards to be able to deliver sub-$3,000 Pentium Pro desktop systems.

Again the operating system seems to be the point of differentiation for Intel in this area. "The combination of 32 bit performance, manageability and affordable system price points make the Pentium Pro processor platform the highest performance and the best value choice for business applications using Windows NT today," added Everett.

He further suggested that the Pentium Pro would appeal to those who want to use industry manageability standards such as the Desktop Management Interface (DMI).

These manageability features are supposed to give information technology managers the ability to remotely administer technical support tasks with greater ease. By taking advantage of the latest system management tools and software instrumentation, Intel says that Pentium Pro processor-based systems will make it easier and cheaper to service and support PCs.

It says that information technology managers are increasingly deploying standards-based management with DMI-enabled products such as Intel's LANDesk management applications and launched a new product, LANDesk Client Manager, at the same time as the new Pentium Pro chip set.

This LANDesk Client Manager is a DMI-compliant application (including a software agent and user interface) for local and network management of desktop client systems. It is supposed to reduce the number of help desk calls by supplying the user with self diagnostics such as a PC health meter and local alert of potential problems. For example, the application should indicate when memory usage is high or hardware components are likely to fail.

Intel says lower prices have been achieved through new levels of chip set integration in the Intel 440FX PCIset. It apparently uses half the number of components than the previous Intel PCIset, yet offers additional features such as scalability (through Concurrent PCI), ease of use (through support of the Universal Serial Bus) and reliability (through Error Checking and Correction technology).

"For information technology managers, the 440FX PCIset in Pentium Pro processor based desktop and entry-level server systems will help lower the costs associated with adding new capabilities, as well as lower the corporate cost of ownership," claimed Everett.

It is the second chip set to support Intel's new-ish Concurrent PCI processing architecture, the 440FX is supposed to maximize system performance with simultaneous activity on the CPU, PCI and ISA buses. Concurrent PCI aims to offer increased bandwidth to better support 2D/3D graphics, video and audio and processing for host-based applications.

Intel is offering this motherboards to PC system manufacturers in three formats: the VS440FX ATX form factor single processor based board, the AP440FX LPX form factor single processor based board, and the PR440FX custom ATX form factor dual processor based board. It is also letting OEMs and systems makers various combinations of features such as Fast Ethernet, LANDesk Client Manager, video, audio, SCSI and Universal Serial Bus. ❑

COSMOS tracks Canadians out of the country

BY W. MONTGOMERY FITZGERALD

T.S. Eliot once wrote, "We shall not cease from exploration and the end of all our exploring will be to arrive where we started and know the place for the first time."

Now thanks to a bilingual computerized tracking system designed by an Ottawa based company the Foreign Affairs department will be able to know when and where you began your journey and how, if applicable, it ended.

Three years ago AMITA Management and Information Technology Corp. concocted Foreign Affairs' new cyber compass called COSMOS. The work application was installed on the department's SIGNET service which links 130 Canadian missions around the world. Gar Pardy, director-general of Foreign Affairs consular services bureau, touts COSMOS as the most comprehensive person tracking tool in the world. "No other government has as an advanced system as we have," he says.

This is how it works. If a Canadian who is living or travelling abroad happens upon misfortune, the Canadian embassy, high commission or consulate files a report. The information appears in COSMOS's case management tool, CAMANT.

Immediately the folks at Foreign Affairs Ottawa headquarters are informed of the problem—be it a plane crash, kidnapping or sudden death—and begin the process of contacting family members back home in Canada while their counterparts in the foreign mission work to solve the problem. Though the system works faster than telephoning or faxing the information back and forth, Pardy concedes there are some snags.

"Sometimes, a country isn't as forthcoming in cooperating with us," he says. "If someone gets into trouble, they usually will if it's a criminal case. But if it's a case involving a political crime, they may not be as helpful."

CAMANT is Foreign Affairs' red flag on COSMOS. Another tool called ROCA (Registration of Canadians Abroad) is used more as a warning device. For instance, if a country is about to explode into civil unrest —Niger being the latest simmering pot— Foreign Affairs will use ROCA to contact Canadians living in the potential trouble zone and keep relatives in Canada informed of any developments.

But in this case, the Canadian living overseas has to help. If they're not registered with a Canadian mission, the speed with which Foreign Affairs can start sounding the warning bells is considerably reduced. "Our recourse is to contact the country they're believed to be in and attempt to determine when they entered or left ... or, ask their family what their travel plans were," says Pardy, who has served in Canadian missions in the United States, India and Costa Rica, where he also kept an eye on such potboilers as Nicaragua and El Salvador.

These are not the best scenarios when the tanks are rolling down the streets. But, though there are about 1.5 million Canadians living abroad on a semi permanent basis, not all register with a Canadian mission. (Foreign Affairs recommends you register if you plan to live outside Canada for more than three months.)

Within that total of all intrepid Canadians are some 800,000 living in the U.S. "They don't bother to register because the U.S. is so close to us, they share the same language with most Canadians and it's generally not a problem," says Pardy. On the other hand, a Canadian headed for Rwanda or Bosnia Herzegovina better think twice about remaining registration free.

COSMOS also offers Foreign Affairs types their own contingency planning tool (CONPLAN) with which they can share information about the internal goings-on of any

Continued on page 55

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Politicians ponder darker side of Internet

Halting transfer of terrorism tips discussed by G-7 ministers

BY W. MONTGOMERY FITZGERALD

Not long ago the Internet was seen as a quick way of sending a message to someone—no matter where they lived. Today there is a growing fear that it is becoming a haven in which to share information on how to kill or terrorize people—no matter where they live.

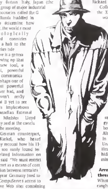
In late July foreign ministers from Canada, the United States, France, Germany, Britain, Italy, Japan (the original group of major industrialized democracies called the G-7) and Russia huddled in Paris to determine how together the world's most technologically advanced countries can put a halt to the Net's darker side.

"There is a generation growing up that has a new tool, a powerful, powerful tool of communications, perhaps one of the most powerful we've ever had, and we haven't really looked at it yet to see what its implications are," Canadian External Affairs Minister Lloyd Axworthy said at the conclusion of the meeting.

His German counterpart, Klaus Kinkel, who heard Axworthy recount how his 11-year-old son easily found terrorism-related information on the Net, said: "We must restrict the Internet as a means of communication between terrorists."

Last year Germany tried to restrict CompuServe's access to alternative Web sites containing sexually explicit material. In response CompuServe cut off access to the sites for everyone over a four month period. That, however, did not prevent CompuServe subscribers from cleverly linking to the suspicious sites through long-distance telephone line connections.

So far, national Net control remains an elusive goal, whether it is intended to block the activities of terrorists or sexual voyeurs. Though Axworthy says the implications of the Internet's potential may have yet to be fully realized, its effects are already starting to show.



U.S. investigators seek online links

While Axworthy and his G-7-plus-one colleagues discussed the threat of terrorism, the U.S. investigators were trying to make some sense out of the madness demonstrated by the Centennial Olympic Park bombing in Atlanta. Days after the Paris meeting, U.S. officials were chasing a possible link between Olympic security guard, Richard Jewell, and Piedmont College near Atlanta where the 33-year-old Georgian once worked as a security guard. Could Jewell have used the college's computers to access the Internet and learn how to make a bomb—taking him from the status of one of this year's Olympic heroes who notified police of a suspicious bag to terrorist?

In days gone by, criminal investigations would have leaned toward eyewitness testimony in gathering evidence against a suspect. Today technology—like the Internet—has become that pair of eyes. After all, Internet 1996 lives in the world of the Unabomber, where the one-time masked terrorist now hides behind a computer terminal.

Arrest made for Net threats

When cyber threateners are caught, both the police and the media pay special attention to them and their threats as a new breed of terrorists. In late May police in Sacramento, Calif. charged Jose Saaverda, a 19-year-old University of Texas student, with using the Internet to make a terrorist threat against a public official. Saaverda was displeased with California Senator Tim Leslie's support for mountain lion hunting. So, Saaverda sent an e-mail message to several environmental and political discussion groups suggesting Leslie become the target of hunters.

Continued on page **55**

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Darker side of the Internet

Continued from page **52**

In California, the penalty for threatening on the Internet carries a fine of up to US$6,200 and a maximum of three years in prison.

In Canada, intimidation through threats is illegal. Should a person charged with "criminal harassment" be convicted, he or she would face up to five years in prison.

But the Canadian Criminal Code is also quite specific in protecting an individual's privacy rights. Police are compelled to convince a judge there is reasonable evidence to believe someone is engaging in or about to engage in criminal activity. That includes the Internet.

"We can't just tap into someone's Internet account at random," says Gaetan Blais, a spokesperson for the Canadian Security and Intelligence Service (CSIS). "We need to submit a request for a search warrant from the federal court first."

Until recently, the Net had not been one of CSIS's prime focuses, says Blais. "By itself, it is not a concern to the service—only if it may constitute a threat to the security of Canada and [to the] the extent [that] the Internet may [be] used in support of terrorist activities."

Following the July foreign ministers meeting, CSIS's attention on the Net will likely increase. By Christmas, security experts from the eight countries are expected to report on strategies to intercept terrorist-related information on the Net.

But George White, a computer science professor at the University of Ottawa, doubts Canada, let alone the other seven nations, will be able to produce a comprehensive set of regulations for the Internet.

"This year's U.S. court decision upholding the constitutional right to freedom of expression as it pertains to the Internet is going to make it very difficult politically," he says. "I think you're going to see arguments raised comparing the Internet to the phone. Are we going to monitor every phone call made?"

As Pierre Bourque, author of *Government On-Line in Canada*, told *The Globe and Mail*, "What's Lloyd Axworthy going to do? Is he going to close high-school chemistry classes and burn all the books in libraries where you can also learn how to build bombs?"

Cyber tracking

However, police would not have far to go to trace the publishing details of a bomb-making cookbook. Current coding and decoding software could make tracing terrorist chefs an almost impossible task. Already U.S. officials want commercial encryption software available in written form.

But tracking Net criminals is going to require a lot of time and resources on the part of police forces, says White. "Imagine the energy that will be needed in cracking the system? It is going to be so expensive to do."

Perhaps, CSIS and company might wish to consider a variation of Vancouver-based futurist Frank Ogden's idea of the Cyber Republic.

First dreamed up by an Englishman, Dr. Stephen Castell, the Cyber Republic would operate as a sovereign state and run its own electronic defence force that would "protect an asset more valuable today than land was in the Agricultural Age or machines in the Industrial Age—ideas." ❑

COSMOS tracks Canadians

Continued from page **51**

country. But all of this information is kept secret. The only thing civilian eyes will see of COSMOS is TIP, the department's Travel Information Program, which features updates on 150 countries. AMITA built a firewall in COSMOS to only release TIP on the Internet—located in the consular services section of Foreign Affairs' Web site (see contacts).

If you plan to travel to Borneo or the Ukraine, Foreign Affairs will tell you the buzz on transportation, politics, diseases and the like for each destination. For the U.S., this information is broken down into sub-groups. Florida, which is quickly becoming a mini war zone for Canadian tourists, and Atlanta, which hosted the Summer Olympics, are two of the sub groups. AMITA claims COSMOS saves Foreign Affairs $5 million every year in overtime costs for its diplomats.

It's also a cost-friendly training tool. Rather than flying an instructor into a mission, the instructor holes up in an Ottawa office and walks the user through the program over the telephone—wherever they are, no matter the time zone. Still, the department pays $1.3 million ($10,000 per site) a month to run COSMOS. "In most of the world, this kind of service is expensive to run," says Pardy. "It's a lot cheaper back home in North America." ❑

Contact: Department of Foreign Affairs,
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Scotiabank plans Internet banking transactions

BY GRANT BUCKLER

NB—The Bank of Nova Scotia Canada's fourth-largest bank, has announced ambitious plans to support banking transactions on the Internet, starting with a trial this fall and moving to nationwide service in January

The bank, which does business under the name Scotiabank said it will initially let customers check balances, transfer funds between accounts pay bills and review account transactions online

Bob Grant assistant general manager of card products and marketing said that during 1997 Scotiabank also plans to start providing access to investment services and accept applications for some kinds of loans including mortgages over the Internet

The bank will begin offering the service to a test group of employees and eligible customers in the fall officials said It will be available to all customers with personal computers and Internet access starting in January Customers will have to register with the bank before using the service

Grant said customers' names and account numbers will not appear online even once the customer logs in using a confidential identification code and password He said Secure Socket Layer and firewall technology will be used to provide solid security A couple of large banks in the United States have already started similar services Grant said and "they haven't experienced any security concerns," so the Bank of Nova Scotia now feels it is safe to offer online banking services.

The bank also believes that security worries will not stop many of its customers from using an Internet banking service Pointing to a growing volume of electronic transactions, Grant observed that if people will pay for goods by credit card on the Internet they will be prepared to pay bills that way

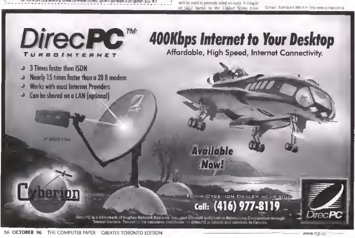
The bank has already signed up about 750 merchants, including major utility companies to have their bills paid electronically through its service, and Grant said the goal is to have about 1 100 merchants signed up by January Customers will be able to pay 97 to 98 percent of their bills through the service he claimed

IBM Canada Ltd has provided technology and services to create the Scotiabank service

TD Access includes investor services

Last month TCP reported that Toronto Dominion Bank would be launching its PC home banking service called TD Access this fall TD Access also includes access to TD's Green Line Investor services ❑

Contact Scotiabank Web site http www scotiabank ca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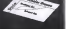

One phone line, so many devices

BY ROD LAMIRAND

Let's be honest here You have a modem in your home computer, it can receive a fax but you have never really used the darned thing! That's not to say you haven't wanted to give out a fax number or that you haven't played around with having someone send you a fax but only that the whole fax modem thing is one big hassle

Sending a fax is not difficult, however receiving a fax has its problems Someone has to call you and tell you that they are going to fax After you run and turn on the computer start the fax software turn off the answering machine and warn your family not to pick up the phone, your aunt calls from Niagara and from inside your computer you hear a little voice saying "Hello? Hello? What is all this beeping?"

Well, here at *The Computer Paper* we lowly writers—the digital proletariat so to speak—are paid to do the research and go through the unavoidable pains of installing fiddling with and finally evaluating products to solve just such a problem Here then, are the answers you need to the question How can my phone faxmodem answering machine etc all be happy on a single telephone line?

Option 1 Add a telephone line

Your first option is to avoid the problem altogether by renting a second telephone line This can be a good investment especially if you spend a lot of time on the Internet. Unfortunately the option will cost you approximately $200 a year indefinitely True there may be a tax write-off if you declare a home business, but there is still a sizable cost and there are also other considerations in deciding to declare your home office as a tax deduction

Option 2 Buy a separate fax machine

A second option is to buy a fax machine This option can be a good idea The better ones will listen for a fax tone known as a CNG tone (CallING), and either have a telephone answering machine (called a TAD in this industry for telephone answering device) or a connection to one The downsides to this option are that you will have to keep buying fax paper the machine costs $300 to $500 when you've already got a faxmodem, and you can't receive editable faxes (if the sender is using a fax/modem as well)

Option 3 Distinctive ring

The third option is to get a service from the telephone company called distinctive ring (also called Smart Ring) Here you are given a second telephone number and a small device that picks up the line and listens for one ring or two (some provinces have a three ring option) You connect your phone to one line and your fax or faxmodem to the other The downside of this solution is that you must buy or rent, the ring detecting device Moreover, the telephone companies charge a monthly fee for the distinctive ring service This ranges from $5 to $7 which adds up to $60 to $84 annually—again indefinitely

Option 4 Line sharing devices

There is a fourth choice and it is a good one There are line sharing devices (LSD) that pick up the line and listen for a few seconds to detect the fax CNG tone If the tone is detected the call is routed to the fax or faxmodem If not it is routed to the telephone and TAD (remember answering machine) Following are two products in this category that are commercially available

ComShare550
From Command Communications
Suggested Retail Price $149 95

The ComShare550 is a small box that goes between your telephone line and all other devices As mentioned above it picks up the line, listens and then routes the call The good thing here is that you are using one telephone line so there are no on going charges Also because the device picks up the line before it rings you don't get an earful of beeps when a fax comes in But wait like me, you probably have a mouth full of questions

Q What does the caller hear?

A. The caller doesn't notice the line being picked up because the unit continues to send a ring signal while it listens

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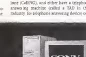

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Q. Doesn't that mean that the person calling will wait longer?
A. Yes, but only one ring at the longest.
Q. What if you pick up the phone to make a call when a fax is being received?
A. You hear a busy signal.
Q. Doesn't this mean that your computer has to be on all the time?
A. Yes it does, and the fax software running too, but depending on your situation you could turn off the system at night or to save a few pennies more, turn off the monitor when the computer is not in use.

The ComShare550 is much more complex than there is space to describe. The unit can be used to access your computer remotely with a security code. You can have the unit call your cell phone and sound a distinctive beep when you receive a fax or even an answering machine message at home. There are provisions for receiving a manual fax, modem-to-modem communication and reverse fax detection.

If you do want it to work with the telephone company's distinctive ring, it will. The unit is programmable and comes with a good manual. Overall we recommend this product as a near-perfect solution to the home office problem of line sharing.

The Stick

From: Multi-Link Inc.
Suggested Retail Price: $179.99

The Stick is comparable to the ComShare550. It too will pick up the line transparently. It will listen for a CNG tone or computer access number. Almost every feature can be programmed if the factory presets are not what you want. The Stick, which won an innovation award at the 1996 International Winter Consumer Electronics Show in Las Vegas, is long and narrow rather than the rectangular shape of the ComShare550. Also, The Stick has an extra jack for a second telephone line on the unit's back. Other than these small differences the units could be identical. There is a decent manual that is well written and at times irreverent. The unit performs as advertised and feels like a solidly built piece of electronics.

The Stick can be used in the front end of a business. Like the other product reviewed here it will work with single or multiple line systems. It can be connected to a fax, fax/modem, modem, answering machine and other devices such as credit card authorization terminals, point of sale terminals and voice mail systems.

It does not work with some telephone services, such as call waiting and call forwarding. The Stick is a good choice for most small and home office applications where a second phone line is too expensive. The unit can be set up to answer the line immediately or after

Continued on page 62

Oh sorry, were you on the phone?

Simple device blocks online interruptions

[illegible] TelePrivacy Plus
[illegible]rer: D&V Telecomm Solutions
[illegible]ed Retail Price: $19.95 per unit

The home user, or home office user, often has enough difficulty finding a quiet moment to get online without the added frustration of having another family member pick up the telephone and interrupt the connection. A small device that came to our attention is TelePrivacy Plus. Simply a small plastic device that goes between each phone and each wall jack, the TelePrivacy Plus steps [illegible] interrupt [illegible]

If you are talking to the prime minister and your daughter picks up the phone, she will only hear a busy signal. You are wondering what if the prime minister has called to speak to your spouse? Well, a simple hook-flash (depressing the hang up button for a split second) and the extensions all work as normal. Place the device between the wall and your computer and, voila, no more lost downloads.

The little units look just like the plastic jacks that you currently have on the wall. You must use one on every phone, answering machine or computer in the home (unless the wall jack is not connected to any device). They have a peel and stick backing and come in packages of two or three.

These inexpensive little products are perfect if members of your household often forget you are online, but they also come in pretty handy if you have conversations that need to be secure.

By the way, this product will not work with line sharing devices like those reviewed in this issue, nor will it correctly work with the automatic dial in your favorite personal information manager (PIM). ❑ —RL

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One phone line, many devices

Continued from page 59

a series of rings. This ability is useful because both units suffer from the same difficulty.

LSD downer

There is one undesirable aspect to these devices that must be made clear. If you have one line coming into the home and that line goes directly to the LSD, without splitting for extensions, and if your computer TAD and all extensions are close enough to run from the LSD, then no problem.

However, if you place the LSD on one of a series of extensions—for example the den phone—then there is a small problem. The LSD will go live at the same time as all extensions. Thus there will be an initial ring at the extensions after which only devices connected to the LSD will ring. This is a real problem—the extensions are not dead, they just don't ring after the first time.

Also, that first ring might be a fax. This isn't the end of the world. If the call is a fax, both devices reviewed allow you to manually transfer the call to the fax by entering a few numbers on the telephone keypad. There is a better solution, but it is not easy and involves splitting the telephone line where it enters the house and running a wire from there to the LSD. This way the extensions will not ring unless the call is a voice call. Both manuals indicate that the procedure may not be easy.

The question that begs being asked is why not simply turn off the automatic answer, take the call, and if it is a fax do the manual fax thing? That is a good question and the answer is that you can buy a lesser unit to do just that. The ComShare350, a unit that sells for around $100, and other similar devices (such as a product called Fax-o-matic) will do just that.

But if the object is to find a product that will automatically answer the phone, detect the fax and route it without ringing the voice phones, both the ComShare550 and The Stick will do this *if* you don't have extensions that bypass the LSD or *if* you want to do a little wiring work.

At a significant saving compared with a second telephone line and a good saving compared with using distinctive ring services, both of the LSDs can allow you to use your current single line as a fax receiving number. ❑

Why not simply turn off the automatic answer, take the call, and if it is a fax do the manual fax thing?

Contact: Cardinal Communications (Canadian distributor of ComShare 550), PO Box 1074, Stn. B, Willowdale, Ont., M2K 2T6. Tel: 416 221 7427. Email: 74674.2071@compuserve.com

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Commerce on Internet slow to root

BY BOB WOODS

FRAMINGHAM MASS (NB)—Despite the unprecedented growth predicted for the Internet and the World Wide Web a new report from International Data Corp (IDC) says that, like the Gold Rush in the 19th century, there's going to be disappointment in them thar hills

The *Content Directions Commerce Sites and Internet Return on Investment* study shows that while many companies believe that business on the Web will resemble "electronic commerce on steroids " some bleak times are still ahead

"Commerce on the Internet is beginning to take root but not quite as rapidly as I would have thought " Michael Sullivan Trainor director of IDC's Internet Commerce and Electronic Messaging programs told Newsbytes

"People are seeing returns, but it's really taking time to digest the technology required and the new business models required [to conduct business on the Net] On top of that businesses are still trying to figure out how to attract customers

Business on the Net is still alive and clicking, but there are major issues to be resolved and rethinking needs to be done in offering electronic commerce " including business models, and creating an interactive site that will attract customers, Sullivan-Trainor said

Some of the study's key findings include that the Internet's best current use is to build relationships increase name recognition, and serve as a prospective tool—and not as a source of an immediate increase in revenue Also the Internet is still close to its roots as a communications medium in that people still use the Web for browsing entertainment and information retrieval

IDC's report also said that consumers remain uneasy about transmitting sensitive information like credit card numbers over the Internet to unknown commerce sites

Content Directions studied the buyer side of the Internet commerce equation by analyzing the results of IDC's quarterly Web Index survey which polled a total of 500 business and home Web users ❑

Contact: International Data Corp
Web site: http://www.idcresearch.com/hic.htm

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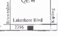

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Calgary, Ottawa tied as Net capital of Canada

BY W. MONTGOMERY FITZGERALD

Ottawa and Calgary are "neck and neck" in the race to become Canada's Net capital says Michel Lucas, a partner with the Ottawa-based Opinion Search Inc.

A recent survey, conducted by Opinion Search and local research ally Phase 5 Consulting Group Inc found 34 percent of office workers in the two cities had access to the Net. That's higher than most major Canadian cities, including Vancouver which reported only 18 percent Net use, and Toronto and Montreal both trailing at 16 percent

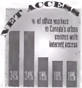
Doug Church, a partner with Phase 5, says he's not entirely surprised by the strong showings of Ottawa and Calgary

"Both cities are fairly high tech and Ottawa has a strong knowledge-based government work force" he said. "Besides the demographics in both cities jibe with high Internet use: young, well-educated people with higher incomes"

The $200 000 study polled 2,270 workers, including senior executives managers supervisors and general staff employees in both the public and private sectors across the country The survey called *The Canadian Information Monitor* is conducted annually

The reason office-bound laborers in Canada's top three urban centres reported a comparatively lower Net use may be a result of availability of goods and services

Although researchers didn't ask the question, Lucas figures the reason office-bound laborers in Canada's top three urban centres reported a comparatively lower Net use may be a result of availability of goods and services "In places like Toronto or Vancouver you're likely to find everything you need in your city and all you might have to do is flip through the *Yellow Pages*"



Fifty nine percent of survey respondents said they relied on Net searches for job-related and general information 28 percent said they use the Net to send and receive e-mail

Though Ottawa and Calgary emerged as Canada's top Net cities Atlantic Canada holds the regional title Fifteen percent of eastern Canadians surveyed said they had office access to the Net, compared with 13 percent in Quebec, 10 percent in Ontario and nine percent from Manitoba to British Columbia.

Atlantic Canada also had the highest proportion of people using commercial online services, such as Compuserve and America On Line, for work, with 14 percent of the workers surveyed compared to nine percent for the Prairies eight percent in B C. and six percent each in Ontario and Quebec

The Phase 5-Opinion Search poll also found 11 percent of Canadian workers or 1 5 million Canadians, have workplace Net access—a five percent increase from last year ❑

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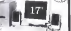

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4) Microsoft Dangerous Creatures
5) Microsoft Golf v2
6) Microsoft Entertainment Pack
7) [illegible]

Pentium 120..**$1699.-**
Pentium 133..**$1809.-**
Pentium 166..**$2069.-**

Intel Triton II (430VX) chipset motherboard
16 Meg EDO memory **256K Pipeline** cache
CPU Heat Sink Fan included
1.26 GB IDE Hard Drive
PCI **Enhanced** IDE Hard Drive controller
Panasonic 1.44M Floppy Drive
2 serial (16550) parallel & game ports
104 keys Windows keyboard
Mid-Tower 7 bays & **230W** Power Supply
Cirrus Logic PCI 1 Meg Super VGA Card
14" .28 Non Interlaced **Green** SVGA monitor
8X IDE CD ROM **16 bits** stereo sound card
DOWA 80W Speakers **Mitsumi** MS compatible mouse
GVC 14.4 internal **fax modem** with voice
One month **unlimited** access of **Internet**
Preload **Windows 95** with manuals & CD Disc
[illegible] years labour & 1 year parts [illegible] warranty

INCREASE YOUR COMPUTER POWER !

Computer Upgrade

286 386 486 → Pentium only $530.-

Package include
Intel Pentium 120 Mhz CPU and Heat Sink Fan
Intel Triton II (430VX) PCI ISA bus motherboard
8 Meg RAM **256K** pipeline cache
1 Meg PCI Super VGA video card
Installation included (condition applied)
9 months parts & labour warranty

Pentium 133	$ 630
Pentium 166	$ 680
Pentium Pro 180 256K	$ 1385
Pentium Pro 200 256K	$ 1485
8 Meg to 16 Meg RAM	+ $ 85
8 Meg to 32 Meg RAM EDO	+ $ 190

All prices are already 3% discounted for cash, Money Order and Certified Cheque (pre approve only) or Direct payment (Interac). VISA, Master Cards or Government P.O. are on regular prices (Regular price = Cash discounted price + 3%). Government, educational institutions & corporate P.O. are welcome, shipping cost is extra. Prices are subject to change without notice

CASES with Power Supply

Desktop 5 bays 230W	$ 79
Mini Tower 5 bays 230W w/LED	$ 50
Mid Tower 7 bays 230W w/LED	$ 60
Full Tower 7 bays 250W w/LED	$ 85
Full Tower 10bays 250W w/LED	$120
Power Supply 230W	$ 40
Power Supply 250W **heavy duty**	$ 55
Power Supply 300W **heavy duty**	$ 78

DRIVES & CONTROLLERS

IDE hard drive removable kit	$ 32
SCSI hard drive removable kit	$ 35
SCSI Case (2 bays & power)	$ 145
IDE Maxtor 1.3GB	$ 257
IDE Maxtor 1.6GB	$ 297
IDE Maxtor 2.0GB	$ 359
IDE Quantum 850M	$ 215
IDE Quantum Bigfoot 1.28GB	$ 250
IDE Quantum Fireball 1.28GB	$ 278
IDE Quantum Sirocco 1.7GB	$ 304
IDE Quantum Bigfoot 2.5GB	$ 358
IDE Quantum Fireball 3.2GB	$ 419
SCSI Quantum Fireball 2GB	$ 589
SCSI Quantum Atlas 4.3GB	$1299
IDE Seagate 1.26GB	$ 248
IDE Seagate 2GB	$ 370
IDE Western Digital 1.26GB	$ 273
IDE Western Digital 1.6GB	$ 310
IDE Western Digital 2.1GB	$ 375
IDE Western Digital 2.5GB	$ 428
IDE Western Digital 3.1GB	$ 530
Conner Int 800M drive (**Free** tape included limited time only)	$ 185
HP Ext 800M tape drive	$ 266
Conner Int 3GB tape drive	$ 335
Conner Int 4GB scsi tape drive	425
Conner Ext 4GB scsi tape drive	595
HP Int [illegible] 8GB scsi tape drive	525
Tape Travan 800M (TR 1)	$ 42
Tape Travan 3GB (TR-3)	$ 47
Tape Travan 8GB (TR-4)	$ 68
Tape DDS 90M 2GB (Sony)	$ 25
Panasonic 5 1/4" 1.2M	$ 62
Panasonic 3 1/2" 1.44M	$ 30
IDE ISA controller w/ 16550 I/O	$ 29
IDE VESA Enhanced IDE & I/O	$ 28
SCSI Adaptec 2940 (bulk)	$ 239
SCSI Adaptec 2940 PCI kit	$ 279

CPU CHIPS

Cooling Fan for 486	[illegible]
Cooling Fan for Pentium	[illegible]
Intel Pentium 120 CPU (Call)	$ 205
Intel Pentium 133 CPU (Call)	$ 297
Intel Pentium 150 CPU (Call)	$ 395
Intel Pentium 166 CPU (Call)	$ 550
Intel Pentium Pro 200 CPU (Call)	880

MOTHERBOARDS

All PC motherboards come with Enhanced IDE & two 16550 serial

Pentium 256K Pipeline cache motherboard only (Triton 430FX)	$ 149
Pentium 256K Pipeline cache motherboard only (Triton 2 430VX)	$ 166
Pentium 256K Pipeline cache motherboard only (ASUS Triton 3)	$ 238
Pentium 120 256K (430VX)	$ 368
Pentium 133 256K (430VX)	$ 453
Pentium 150 256K (430VX)	$ 555
Pentium 166 256K (430VX)	$ 710
Pentium Pro 180 256K (ASUS)	$1202
Pentium Pro 200 256K (ASUS)	$1322

MEMORY

ATI VGA card 1M (SOJ 2 pieces)	$ 29
CL VGA card 1M (SOJ 2 pieces)	$ 29
Static RAM 32Kx8	$ 7.5
DRAM 44256-70	$ 6.5
Pipeline 256K cache	$ 30
Pipeline 512K cache	$ 65
SIMM 1M 70 30 pins	$ 13
SIMM 4M 70 30 pins	$ 43
SIMM 4M 70 72 pins	$ 33
SIMM 4M 70 72 pins Parity	$ 54
SIMM 8M-60 72 pins (2 sides)	$ 58
SIMM 8M-60 72 pins EDO	$ 64
SIMM 8M 70 72 pins Parity	$105
SIMM 16M-60 72pins	$122
SIMM 16M 70 72pins	$118
SIMM 16M-60 72pins EDO	$122
SIMM 16M 70 72pins Parity	$182
SIMM 32M-60 72pins	$240
SIMM 32M-60 72pins EDO	$240

Multimedia Upgrade Kits

Toshiba 8X IDE CD ROM $186.
16 bits stereo sound card & Speakers

Toshiba 8X IDE CD ROM $266
Creative Technology 16 bits IDE stereo sound card & **Amplified** speakers

Toshiba 8X IDE CD ROM $335
Sound Blaster 32 IDE sound card &
DOWA 80W speakers system

CD ROM

Panasonic Int **8X** IDE 145ms 128K	147
Toshiba Int **8X** IDE 160ms 256K	$ 147
NEC Int **4X** SCSI 145ms 256K	$ 147
Sony Int 4020 CD Writer	$ 880

SOUND CARDS & SPEAKERS

16 bits sound card	$ 43
16 bits sound card w/wave table	75
SoundBlaster 16 IDE card	$104
SoundBlaster 32 IDE	$145
SoundBlaster 32 IDE PnP (Full)	$189
SoundBlaster AWE 32 IDE (Full version Retail box)	$298
Desktop microphone	$ 17
Headphone with microphone	$ 28
Basic speakers	$ 8
MW-6183 5W amplified speakers	26
Zoltrix 60W speaker system	$ 35
DOWA 80W speaker system	$ 49
SIGN NOTE 180W speaker system	99

SCANNERS

HP ScanJet 4P Color	$ 679
HP ScanJet 4C Color	$1260
Kodak DC40 Digital Camera	$ 860
Kodak DC50 Digital Camera	$1217
Logitech ScanMan Color w/OCR	26

INKJET PRINTERS

Canon BJC-210 Color	$ 198
Canon BJC-240 Color	$ 248
Canon BJC-4100 Color	$ 299
Canon BJC-4550 Color 11x17	$ 626
HP DeskJet 400 with Color	$ 290
HP DeskJet 600 Black	$ 250
HP DeskJet 600 with Color	$ 290
HP DeskJet 660C Color	$ 400
HP DeskJet 820Cx (Windows Only)	$ 519
HP DeskJet 870 Cx Color	$ [illegible]
HP DeskJet 1600C Color	$1879

LASER & LED PRINTERS

Canon 460 4ppm 600dpi	$ [illegible]
HP 5L 4ppm 1M 600dpi	$ 665
HP 5L + extra HP toner ("Special" Total 2 toner cartridges)	$ 715
HP 5P 6ppm 2M 600dpi	$1164
HP 5P "DEMO model" only 800 pages printed	$1124
HP 5MP 6ppm 3M 600dpi	$1403
HP 5 12ppm 4M 600dpi	$1737
HP 5N 12ppm 4M 600dpi	$2150
HP 5M 12ppm 4M 600dpi	$2485

PRINTER ACCESSORIES

4 Meg HP 4+/4M+/4P/4MP/5P/5	$ 82
4 Meg HP 4/4Si/5Si/1200	$ 192
4 Meg HP 5L	$ 173
8 Meg HP 4+/4M+/4P/4MP/5P/5	$ 139
8 Meg HP 4/4Si/5Si/1200	$ 175
8 Meg HP 5L	$ 242
Canon BJC4000 small color ink	26
Canon BJC210 Black ink	$ 19
Canon BJC210 color ink	$ 37
HP Toner for 4/4m/4+/4m+	$ 14[illegible]
HP Toner for 4L/4P/4MP	$ 99
HP Toner for 5L "Special"	$ [illegible]
HP Toner for 5P/5MP	$ 120
HP DeskJet ink storage box	$ 8
HP DeskJet Black 51626A	$ 40
HP 600C Black/Color ink Cart	$ 42
Ok 400/800/400e/410e Toner	$ 43
Pana 4400/Raven 410 Toner	$ 43
Pana 4410/Raven 510 Toner	$ 49
Raven LS-3 LS-6 Toner	$ 48
Raven LP410 Drum KXPDM8	$ 142
Raven LP510 Drum KXPDM5	$ 162

INPUT DEVICES

BTC/Win 104 keys	$ 23
Keytronic [illegible] 104 keys	$ 35
Microsoft Natural Keyboard	$100
Bondwell QS 23 joystick	$ 25
Microsoft SideWinder 3D Pro joystick	86
Mitsumi mouse MS compatible	$ 13
Microsoft mouse v2.0	$ 35
Logitech Sensa Mouseman	$ 25

VIDEO CARDS

Trident ISA 512K	$ 49
Cirrus Logic/Trident ISA 1M	$ 78
Trident 9440 PCI 1M	$ [illegible]
Cirrus Logic 5430 PCI 1M	$ 46
Cirrus Logic 5446 PCI 1M	$ 57
Cirrus Logic VESA 1M/2M	55/75
ATI Mach 64 DRAM 1M PCI	$ 85
ATI Mach 64 DRAM 2M PCI	$ 97
ATI VideoXpression 2M PCI DRAM	142
ATI TV tuner for video Xpression	$ 13[illegible]
ATI 3D Xpression 2M PCI DRAM	$ 149
ATI WinTurbo 2M PCI VRAM	$ 2[illegible]
Matrox Millennium PCI 2M (Full version in retail box)	$ 330
Matrox Millennium PCI 4M (Full)	$ 489

MONITORS

14" Daytek .28 NI Green	$ 275
15" GVC 1280 .28 Digital	$ 430
15" Mag Data DX1595 1280 .28	$ 495
15" Mag Data DX15T 1280 .26	$ 527
15" Samsung GLs 1024 .28	$ 45[illegible]
15" Samsung GL 1280 .28	$ 499
15" Sony 55SX 1280 .25	$ 545
15" Sony 55SF 1280 .25	$ 639
15" Viewsonic 15GS 1280 .28	$ 539
17" Daytek 1730 "DEMO" 1280 .28 Full warranty	$ 690
17" Daytek 17[illegible] 1280 .28	$ 742
17" Mag Data DX17[illegible] 1280 .26	$ 849
17" Mag Data DX17T 1280 .25	$ 979
17" Samsung GL 1280 .28	$ 820
17" Samsung GLsi 1600 .26	$1050
17" Sony SF2 1280 .25	$1150
17" Sony SE21 1600 .25	$1525
17" Viewsonic 17EA 1280 .28	$ 857
17" Viewsonic 17PS 1600 .25	$1015
20" Samsung GLs 1600 .28	$1595

FAX MODEMS

GVC 14.4 Int with Voice	$ 75
GVC 28.8 Int v34	$ 138
GVC 28.8 Int v34 with Voice	$ 158
GVC 28.8 Ext v34 with Voice	$ 178
USR 28.8 Int v34 (windows only)	$ 138
USR 28.8 Int v34	$ 175
USR 28.8 Ext v34	$ 219
USR 28.8 Int v34 V speakerphone	215
USR 28.8 Ext v34 V speakerphone	249
USR 28.8 Int v34 Vi & DSVD	$ 237
USR ISDN Internal 128Kb/s	$ 410

NETWORKS

GVC 16 bits ethernet card PnP	$ 59
GVC 32 bits PCI ethernet card	$ 125
GVC 8 ports ethernet hub	$ 237
Ethernet Cable RG58	0.48/ft
Ethernet Cable 10 Base T FT4	0.48/ft
Ethernet Cable 100 Base T FT4	1.00/ft
10 Base T Connector	4
BNC Connector	4
BNC Terminator	4

Uninterruptible Power Supply (UPS)

Power Conversion

APC BackUPS 280	$ 159
APC BackUPS 400	$ 209
APC BackUPS Pro 420	$ 338
APC BackUPS 600	$ 348
APC BackUPS Pro 650	$ 410
APC BackUPS 1250	$ 610
APC BackUPS Pro 1400	$ 690

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Windowing System Manager	$ 166
General Ledger and Financial Reporter v6.1	$ 599
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Account Receivable v6.1	$ 599
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from 4MB TO 16MB (72 PIN)	$99
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ATI 2 MB PCI MACM64 DRAM	$99
WESTERN DIGITAL 1.6GB	$309
SEAGATE 2.1 GB	$359
TOSHIBA 8X CD ROM, SB16 & SPEAKERS	$229
100 Mhz PENTIUM® chip	$1049
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ABOVE SYSTEMS INCLUDE

8MB Ram, 1.08GB EIDE HDD, 256K Pipeline Cache, 1MB SVGA PCI Video, 14" SVGA N/I 1024x768 (.28dp) Colour Monitor 1.44MB FDD, 2 Serial, 1 Parallel, 104 Key Enhanced Keyboard, Mini Tower Case, 230 W Power Supply, 1 Year Labour & 1 Year Parts. Prices are already 3% Cash Discounted.

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Kodak's DC-20 digital camera

Small and under $500, but are the minimal features enough?

BY KEITH SCHENGILI-ROBERTS

Courtesy Beau Photo Vancouver

System Requirements: MS WINDOWS - Windows 3.1 or later, 386 33 MHZ minimum PC, 6 MB of memory, CD-ROM drive and available serial port. MACINTOSH: System 7.1 or later, 8 MB of RAM, 68020-based CPU, CD-ROM drive and available serial port.

The digital camera wars continue as Kodak releases the most affordable, entry level digital camera, the DC-20. It is a basic point and shoot camera, stripped

Continued on page 72

Computer House

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Pentium® 120MHz MultiMedia System

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Mouse & Mouse Pad
8X IDE CD ROM Drive
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Monthly Special
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Upgrade Option	
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The Above Prices Already Cash Discounted

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Pentium 133	$+105
Pentium 150	$+225
Pentium 166	$+365
Pentium 200	$+860
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15" SVGA N/I .28 Monitor	$+130
17" SVGA N/I .28 Monitor	$+460
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63 MO

STORMmultimedia Elite Pentium-133

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P-120 $1925 | P-150 $2099 | P-166 $2295 | P-200 $2895
Cx133 $1895 | Cx-150 $1950 | Cx-166 $2095

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ALL THE BRAND NAME / HIGH QUALITY COMPONENTS

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PANASONIC / SONY 3.5"

Video Card DIAMOND
Chosen by PC-Magazine Award Winner Family [illegible] Stealth 3D 2000 2MB Magic RAM Full Motion MPEG Video [illegible]

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NEW
400% FASTER

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[illegible] Pentium 60/75/90/100/120/133/150/166/180/200 MHz [illegible] 512K PIPELINE Cache INTEL Triton [illegible] PnP FLASH BIOS, 4 PCI, 4 ISA Slots, 2X16550 UART Bi-Directional LPT [illegible] 4 X IDE [illegible] Hard Drive Support [illegible]

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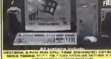

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HEATSINK & FAN FOR CPU, 104K ENHANCED KEYBOARD MID/S TOWER [illegible] MOUSE & PAD
3 YEAR PARTS & 3 LABOUR WARRANTY

HURRICANEmultimedia Pentium - 166

DFI TRITON-3 VX BOARD 512K PIPELINE CACHE E-IDE PCI CONTROLLER PIO-4 2X16550 UART 2.5GB QUANTUM OR WD 10MS 128K CACHE HD 32MB 60NS EDO MEMORY 1.44 FLOPPY DRIVE Matrox Millenium 3D Video 2MB W-RAM PC-MAGAZINE EDITORS CHOICE (1995 1996) SUPPORT FULL SCREEN DIGITAL MPEG & VIDEO CD-I 17" PRINCETON GRAPHIC EO PnP .26MM 1280X1024 N I USVGA LR MRP II MONITOR PC WORLD AWARD WINNER FAMILY (BEST BUY) SOUND BLASTER AWE-32, 32-VOICE POLYPHONY ADVANCED WAVE TABLE SYNTHESIS, 3D SOUND TOSHIBA 8X CD-ROM 145MS 1,200 KB/SEC SOUND FORCE-600 30W AMP STEREO SPEAKERS 104K WIN95 KEYBOARD & MICROSOFT J-MOUSE WINDOWS 95 CD PREINSTALLED & CONFIGURED

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[illegible]

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Pentium-120 [illegible]
Pentium-133 [illegible]
Pentium-150 [illegible]
Pentium-200 $3,406
Cyrix 6x86-133+ [illegible]
Cyrix 6x86-150+ [illegible]
Cyrix [illegible] $CALL

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Princeton 20" Ultra PnP NI Low Radiation	$1550
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MAG Trinitron 17" PnP NI LR 75Hz .25dp	$989
SONY 17" SF2 1280x1024 LR PnP .25dp	$1169
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VIDEO CARDS

DIAMOND STEALTH 3240 2MB VRAM	$CALL
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DIAMOND DTV 1100 3 VIDEO SOURCES	$149
DIAMOND 1100 MPEG HARDWARE CARD	$149
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MATROX MYSTIQUE 3D 2MB SGRAM	$249
SM-VISION S3 TRIO64V+ MPEG 1MB EDO	$65
SM VISION S3 VIRGE-64 MPEG 2MB EDO	$129

SOUND CARDS

SOUND BLASTER AWE 32 PnP RETAIL	$219
SOUND BLASTER AWE-32 OEM WAVE	$185
SOUND BLASTER-32 PnP WAVE 3D RETAIL	$209
SOUND BLASTER 16 PnP E-IDE ORIGINAL	$85
ORCHID Nu-Sound PnP 3D 340effects WAVE	$165
GRAVIS Ultra Sound PRO PnP 3D Full Duplex	$229
PIONEER 40W Powered Stereo Speakers	$49
Sound Force-800 200W Satellite 2+1 Speakers	$189
Sound Force-600 30W Powered Stereo Speakers	$49
Sound Force 510 14W Powered Stereo Speakers	$38

CD-ROMs / CD-R

PLEXTOR 8X 1200Kb/sec SCSI INT	$419
PLEXTOR 6X 900Kb/sec SCSI INT	$329
SONY 4X QUAD Speed SCSI Internal	$159
TOSHIBA 8X 1200Kb/sec E-IDE INT	$139
YAMAHA 2W-4R CD-R INT/EXT	$779/$879
YAMAHA 4W-4R CD-R INT/EXT	$1379/$1479
PIONEER 4W-4R CD-R EXTERNAL KIT	$1899
CD AUDIO CABLE / CD DATA CABLE INT	$5ea
KODAK/MITSUI/MAXELL Blank Writable CD	$15

HARD DRIVES

SEAGATE 2.5" E-IDE 420MB Notebook HD 16ms 64k	[illegible]
SEAGATE 2.5" E-IDE 810MB Notebook HD 16ms 128k	[illegible]
SEAGATE 2.5" E-IDE 1.2GB Notebook HD 14ms 128k	[illegible]
SEAGATE 3.5" E-IDE 850MB 14ms 64k (Conner)	$219
SEAGATE 3.5" E-IDE 1.08GB 10ms 128k Cache	$340
SEAGATE 3.5" E-IDE 1.2GB 10ms 256k 5400RPM	[illegible]
SEAGATE 3.5" E-IDE 2.1GB 10ms 128k 5400RPM	$379
SEAGATE 3.5" SCSI 2.1GB 8ms 512k 7200RPM	$799
SEAGATE 3.5" SCSI-WIDE 2.1GB 8ms 512k Cache	[illegible]
SEAGATE 3.5" SCSI-WIDE 4.2GB 8ms 512k Cache	$1420
SEAGATE 3.5" SCSI-WIDE 4.2GB 8ms 1MB Cache	[illegible]
SEAGATE 5.25" SCSI 9.1GB 11ms 1MB Cache	$3099
SEAGATE 5.25" SCSI-WIDE 9.1GB 11ms 1MB	$3199
QUANTUM 3.5" E-IDE 1.7GB 11MS 128k Cache	$325
QUANTUM 3.5" E-IDE 2.1GB 11MS 128K Cache	$379
QUANTUM 3.5" E-IDE 3.1GB 11MS 256k Cache	$CALL

FAX / MODEMS

U.S.Robotics

33.6 Sportster VI Ext	$229
33.6 Sportster DSVD	$249
33.6 Sportster VOICE Int	$219
33.6 Sportster VOICE Ext	$269
33.6 Sportster V.34 Int	$199
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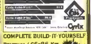

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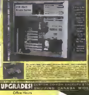

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SMART MACHINE

Microsoft launches Internet Explorer 3.0:

Hot new browser has rocky start

BY JEFF EVANS

In a launch ceremony that was a good deal less lavish than the celebrations that surrounded the release of Windows 95, Microsoft founder and chief executive officer Bill Gates showed off the new product to the media on Aug 13 Gates claimed that Internet Explorer 3 0 was coming out of the gala with less fanfare than Win 95, "but when you look at it, it is equally important in terms of the changes over the Internet."

The new version of the Microsoft browser includes admission to over 40 World Wide Web sites that can only be accessed for free by Internet Explorer 3 0 including ESPN's Sports Zone and The Wall Street Journal (Those who revere the Web as the world's first truly free publishing medium may find this proprietary access to content annoying.)

Gates took the high road in his comments claiming that the Internet is on the way to becoming a truly universal medium

"What it is, is the mainstream way we will communicate in the future. And if this is as important as we think it is, then everybody ought to have a chance to use it, not just people who have PCs at home, but anybody It will be a long time before that takes place [*Not so long according to Netscape See What's New item on Navio.—Ed.*), but it is very exciting to see that get started"

An administration kit for information systems managers is also available for free, offering tools for customizing the use of the Internet Explorer browser in areas such as security In addition to browsing HTML documents Gates claimed that Internet Explorer 3.0 lets the user browse any document that supports object linking and embedding (OLE) call up linked files, and edit them in the browser window Gates claimed that Internet Explorer is open to a wide array of development tools including Java Basic and C programming languages.

The launch was accompanied by Microsoft "Midnight Madness" activities in various countries, which included promotional activities such as giveaways of free T shirts

Microsoft reported over a million downloads of its new browser in the first week after release, indicating substantial immediate interest by Internet users.

However those one million new users began reporting bugs almost immediately after Internet Explorer 3 0's launch Microsoft's Web site promptly began listing a variety of reported problems, including a tendency for the screen to flicker when loading Web pages inability to run Trumpet Winsock, incompatibility with Netscape plug-ins, failure of paste, copy and edit commands to work in some files, and a tendency under some circumstances for the browser to continually ask for user names and passwords

Microsoft has acknowledged the problems, and is issuing patches to fix some of them and a new version of the browser itself (see contacts for information and software download site) Microsoft claims that some of the problems are not caused by Internet Explorer 3 0, but rather are issues that need to be addressed by third-party developers. Microsoft claims that it is working with these developers as well as developing fixes for remaining unresolved problems that are directly related to Internet Explorer 3 0

Meantime, other unsympathetic folk were raining on Microsoft's parade nipping at its heels and generally annoying the software giant A tiny Chicago-area firm called Synet is suing Microsoft over the very name "Internet Explorer," claiming copyright of the name based on their use of it a year before Microsoft adopted it.

Netscape Communications has urged the United States Justice Department to institute an antitrust action against Microsoft on the basis of alleged secret payments they say Microsoft is making to entice customers to remove copies of Netscape from corporate networks and subsidies of $400 million alleged to have been allocated to induce software developers and Web publishers to create software programs and Web sites that would only be fully compatible with Microsoft's Internet Explorer browser software. A Microsoft spokesperson characterized Netscape's complaining as "the pot calling the kettle black."

Microsoft has a potentially hot new product in Internet Explorer 3 0 but if its first couple of weeks on the market are any indication, it will take a while for the battle of the browsers to be decided ❑

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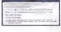

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Kodak's DC-20 digital camera

Continued from page 66

down in the way of features in order to make it affordable for those who are curious about digital photography but don't want to spend more than $1 000 to find out

Kodak has definitely got the right idea in trying to make digital photography more affordable, and undoubtedly over time, this will happen Unfortunately, the DC-20 is too stripped down to be of much use to anyone who intends to be serious about digital photography

The tiny DC 20 looks like a miniature version of a basic point and-shoot camera Only a closer inspection reveals much that is different There is no place to put film in this camera and there is no need—this is a fully digital camera, needing no film Instead, there is a little flap on the side to insert the single AA alkaline battery and a hole to insert the jack that connects the device to your PC.

The camera's "film" a charge-coupled device (CCD) protected by a transparent layer of plastic, is set flush to the camera, beside a small viewfinder.

On top are three buttons, one to turn the camera on one to shoot the picture and a third to erase the pictures contained in the camera On the back of the camera just below the viewfinder are three LEDs that indicate the power level of the camera whether the the camera is busy processing information and whether the memory is full This minimalist approach towards its design makes it very easy to use

The compact DC 20 offers two modes so the user can either shoot eight high resolution (493x373 pixels) images, or 16 standard-resolution (320x240 pixels) images within the camera's 1 MB of internal memory At least that's what it says in the specifications This reviewer could never get more then five shots at the higher resolution, and found the low resolution pictures too low res to be of much use for anything other than thumbnail pictures.

This camera does not include a flash Under most circumstances, this would be a serious drawback. But because of the camera's CCD technology, this is not as detrimental. CCDs are very sensitive to light and can resolve images much better than film under the same poor lighting conditions

This camera is not short on smarts The DC-20 has an ASA/ISO rating equivalent of 800/1600 depending on available lighting conditions and has a focus range of 50 cm (20 inches) to infinity and a focal length of 47 mm. The camera has shutter speeds of 1/30 to 1/4 000 second and has an aperture of f/4 to f/11, both of which are automatically selected by the camera.

The picture transfer software provided with the DC-20 is a bit "twitchy" and definitely could do with some improvement The only way to download pictures is to first acquire thumbnail images of them. You then select the ones you want Unfortunately the software tends to shut down the transfer of images from the camera. The camera needs some time to initialize the transfer of images to the computer, and often the software times out just as the transfer begins Worse is the fact that the program shuts down every time a transfer failure occurs meaning you have to go through the entire process again. This software is 16-bit and a test found that while it worked flawlessly under Windows 3.1, it was problematic when using either Windows 95 or Windows NT

Another drawback is the fact that this is not a "reflex" camera which means what you see through the viewfinder is not necessary what the lens of the camera sees This is not a problem when taking pictures of subjects more than a couple of metres away but if you are trying to take a shot of something close you will have to shoot your pictures slightly offset to the left to allow for the slight deviation from what you see and what the camera will shoot This is not a feature you would expect to see in a budget digital camera--you do get this with budget film cameras—but it is a feature prospective buyers should know about

What makes this camera stand out from the rest of the pack is its price listed at $495 Its small size means that it fits unobtrusively into your pocket, and is easy to whip out for a quick shot of anything that takes your fancy

While this is the cheapest camera in its range, many users will find it underpowered for regular use It is a step in the right direction and as memory prices continue to fall and the idea of digital photography takes hold you can expect much more "bang-for you-buck" in the near future. ❑

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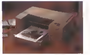

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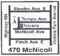

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Typing tutors: Three routes to keyboard mastery

BY JEAN ALLEN-IKESON

Like many older "boomers," I learned how to type in high school using an old manual typewriter. There were only a few reasons to enroll in such a course to learn to type letters or term papers or if you planned to work in an office

Enter the Computer Age Either your fingers fly over the keyboard as you flash commands in the edit mode so fast your friends have no idea what you are doing or you hunt and peck with two fingers and look embarrassed because you are keyboard challenged

Not knowing how to type these days is right up there with having training wheels on your coffee cup or asking how to push enter on the photocopier

One of the first pieces of software to be written for home computers was a typing tutor—a crude but a nice toy These days there are several excellent CD ROM based tutors that all do the job Each is a bit different and has its strengths All keep track of typing speed and progress with the tutorials.

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Mavis Beacon Teaches Typing

From Mindscape
Requirements Windows 3 1 Win95 or Macintosh
Est. Street Price $48 00

Probably the best known program is Mavis Beacon Teaches Typing If you look for it in the stores you may find several versions some of which are still available on diskette The CD-ROM version, however is still plain old Mavis with a few bells and whistles The manual is excellent There is background music and keyboards and the games are interactive However, the instructions are all written out so you are constantly "reading" what to do next

The program is organized like a traditional typing course—loads of repetitive practice However you can modify the tutorials for a standard Qwerty keyboard the Dvorak keyboard (a more efficient arrangement of keys, which is unfortunately difficult to find) or a 10-key numerical pad You are asked for your skill level and age group (the program is broken down into three age groups, the youngest of which starts at age five)

So whether you are unfamiliar with a keyboard or you are an experienced typist who wants to improve speed and accuracy the program will tailor itself for you

Typing Instructor Deluxe

From Individual Software
Requirements Windows 3 1 Win 95
Est. Street Price $41 99

Typing Instructor Deluxe is like many other products from Individual Software The tutorial is well organized and you can hop around at will The help function is detailed.

This CD ROM is more truly interactive than Mavis Beacon It has videos and audio instructions and can appropriately be described as user friendly

The practice materials for this program are the best. You may choose from 250 different books on a variety of topics. So, if you are a student with a science major, you can type technical topics and vocabulary, or legal topics, or sports. This goes a long way to alleviating boredom and encouraging you to stick with it—the latter being the biggest obstacle for computer tutorials.

Guaranteed to Improve Typing Skills For All Ages!
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DELUXE CD
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Unless some obsessive-compulsive mistress is madly waving a metronome over your keyboard, it is easy to put the session off until later. So programs that take the stress out of learning are a real plus.

The games in Typing Instructor Deluxe are also a little more inventive than those in Mavis Beacon. As you type along, errors are shown in red and you may backspace to correct them. A meter shows your average current typing speed, so if you are competitive there is the incentive to run the meter as high as possible. This is a great improvement over one-minute typing tests and counting the words manually.

On the down side, however, this program is only for users of Qwerty style keyboards.

Typing Tutor 7
From: Davidson/Simon & Schuster
Requirements: Windows 3.1, Win95 or Macintosh
Est. Street Price: $44.95

Typing Tutor 7 from Davidson/Simon & Schuster also has the look and feel of a multimedia program. There are tutorials, practice sessions, tests and games with the usual array of options and progress reports using audio and video clips that make learning more fun.

As with Mavis Beacon, you have the option of learning to type with Qwerty or Dvorak configured keyboards or a 10-key numerical pad. However, real words are used in the tutorials and practice sessions, including excerpts from more than 100 books. The stand-out feature for learning is that, as you type, the cursor moves across the text and turns red and a clear, loud beep sounds when you make an error.

When I learned to type, you never looked at the typewriter, so errors were not apparent until you had finished. Learning always proceeds more quickly when errors are corrected immediately.

And the winner is. . .

All three tutorials allow you to customize practice sessions to give you more time for problem areas. They also monitor speed and errors and provide progress charts. With all three, you enter your name and skill level so more than one user can use the program. But do they work?

Yes, all three are adequate. However, Mavis Beacon comes across as a little dated. It is a toss up between the other two. Typing Instructor Deluxe's organization and typing materials are the best, but Typing Tutor 7 breezes to the head of the pack with error alerting and the option of learning a 10-key numerical pad. ❑

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BY ROD LAMIRAND

Financial Competency and Investment Basics
Company: Competency Software Inc.
Suggested retail price: Financial Competency $130
Investment Basics $89

Which is better? Pay down your mortgage, max out your RRSPs or invest in mutual funds? The answers are surprisingly complex. Also surprising is the number of people who live their life never even understanding the question.

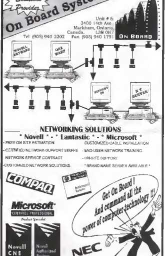
I am often amazed at the financial ignorance that I find around me. Practically every day, I hear some regurgitated nonsense that causes me to wonder which is the more lamentable: feigned comprehension or flaunted ignorance. In either case, the brutally logical world of money will bring doom upon the uneducated. In the world of money, ignorance is a terminal disease. So much more apropos, then, is software aimed at throwing some light into this area.

When financial education is married to the computer, there is often another highly grievous result. The resulting product is either a direct digitization of an economics primer or a razzle-dazzle show that is more fine antics than finances. It is propitious, then, that Competency Software has arrived with two offerings that are neither mind numbingly dull nor computer candy.

Investment Basics

This program comes on three discs and runs on Macintosh, Windows 3.x or Win95. The software teaches by laying down a basic understanding in the terminology and concepts of money. The program is divided into eight parts, which are each divided into a number of smaller sections.

Each section explains an idea or rule and gives an example and asks the user to perform a small exercise to show mastery. The parts take about an hour each to work through, with the whole program taking about eight or nine hours.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Understanding Investment: The Stock Market, The Bond Market, Mutual Funds and Other Investments kick off the first half of the program with Barriers and Handling, Getting Started and Quiz rounding out the rest. Each section is quite informative.

A lot of emphasis is placed on making sure that the user understands the basic relationship between capital, interest, and time

For example, Understanding Investment looks at the interest you accumulate from a bank account and compares it to real estate or the capital gains you can receive from purchasing stock. It also considers mutual funds and tax-protected money such as an RRSP. The Rule of 72 is explained and a lot of emphasis is placed on making sure that the user understands the basic relationship between capital, interest and time. This is a good little program with a great interface, a small footprint and a good re-visiting quality.

The program would be ideal for an individual or business that is looking to explain the basics of money and how to use it. Surprisingly, much of the information contained here would be unknown to most of the adult population. I would rate this program 87 pennies out of a dollar.

Financial Competency

This three disc program installs to Macintosh, Windows 3.x or Win95 to take up about 8 MB of space. It does not require, but uses, a sound card to add sound effects to the graphics. The program is similar to the one above except that it is aimed at the business market. It is much more specialized than Investment Basics.

Financial Competency is divided into the following categories: Overview of Financial Statements, The Income Statement, The Balance Sheet, The Cash Flow Statement, Linking the Statements, Financial Analysis and Review and Exam. Each section takes 30 to 90 minutes to complete.

Financial Competency is a perfect education if you are starting your own business or if you hire employees that do not have a degree in economics. The explanations are detailed and take some work to understand, as they should. The subtleties of maximizing an investment is not something that one can learn in a minute. Even knowing how to properly read a financial statement or understanding the mechanics of a company's IPO takes some education and experience. As an introduction or refresher to understanding the money side of a business, this program is perfect.

This is a program that could be used by an individual who owns or runs a business and does not have an MBA, or by a company interested in giving its middle management some in-house training. On a scale of one to a hundred, I would give this program 74 pennies. ❑

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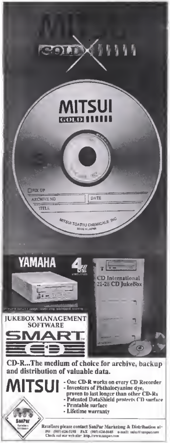

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Sonic Foundry's Sound Forge 4.0

Newest version of audio processing software a feature-rich winner

BY GRAEME BENNETT

Product: Sound Forge 4.0
From: Sonic Foundry
(Distributed in Canada by Roland Music)
Price: US$495

Sonic Foundry's Sound Forge 4.0 is the latest update of a hard disk based audio recording application I first reviewed back in June 1995. By then already at version 2.0, I noted its intuitive interface and marvelled at the vast number of file formats it saved and/or loaded.

The good news is that version 4.0 adds a wealth of new capabilities while managing to avoid "featuritis." The bad news is ... well... there really isn't any, as long as you don't mind paying some fairly serious money for this top-flight application.

Without dismissing its competition out of hand, let me say that I've tested a lot of other digital audio applications, including CoolEdit, GoldWave, Software Audio Workshop (SAW), SoundEdit, Sound Designer, Logic Audio, Cubasis Audio, Audioshop and more, and Sound Forge 4.0 is at the top of the heap both in functionality and in overall elegance and ease of use.

Perhaps this is an unfair comparison, but Sound Forge 4.0 struck me as most closely resembling—of all things—Adobe Photoshop 3.0. Like Photoshop, Sound Forge has previews for virtually all effects, includes an extensive—and extensible—selection of special-effects filters and performs functions one might associate with Adobe's well-known graphics application, such as anti-aliasing, resampling, "sharpening," mode conversion, dithering and so on. It even supports plug-ins. Sound Forge is a true 32-bit application, with long file-name support and full support for Windows 95 and NT (including full support for non-Intel versions of the latter).

Also like Photoshop, Sound Forge's greatest strength is its capability of handling a

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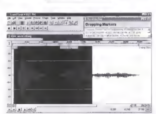

Just select an area and press Delete to remove an unwanted section from an audio sample. Sound Forge's Zoom icon (magnifying glass at lower right) allows you to see a waveform's "zero crossings" visually to make seamless splices easy.

wide range of file types. You can use Sound Forge (and a very large hard disk) to record huge, high-resolution audio files, and you can put it to work as an authoring tool for a wide array of Internet and multimedia file-types.

Because Sound Forge supports standard Windows codecs (unlike SAW), when a new codec comes along like the RT24 codec shipped with Netscape 3.0 (released on Aug. 19), it is automatically available to Sound Forge. WAV, TrueSpeech, RealAudio, AIFF (Apple's standard file format), MIDI Sample Dump standard, and AU are just a few more of the file types directly supported by Sound Forge 4.0.

The only bug I found (and, incidentally, the Sound Forge people maintain it's not a

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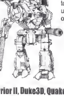

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Finding home-based business opportunities

There is a distinction between an idea and an opportunity. Many people have good business ideas but the idea may not be a viable business opportunity. Careful research, evaluation and preparation of a business plan will separate the real business opportunities from casual ideas.

There are many innovative techniques for finding business ideas and opportunities. But before you start your search, make sure that you have completed a detailed self-assessment. This will help you to find opportunities suited to your lifestyle needs. Here are some sources of information to consider:

Books • There are numerous books available that detail business opportunities that can be started with minimum financing (i.e. about $500 to $1,000). Check with your public library and local bookstores to see if these books are available.

Magazines and newspapers • Read your daily and community newspapers to become aware of trends locally, provincially and nationally. National magazines that cover small businesses are *Profit*, *Entrepreneur*, *Venture Inc.* and *Income Opportunities*. Check at your local newsstand.

Trade and business associations • Almost every type of business has a professional or trade association that you may wish to check into. The association could be local, provincial, national, or international in scope. Check in the *Yellow Pages* under "associations" for ones that interest you. In addition, check with your local library for directories that list associations in Canada and the United States.

Government business resource centres • Check out the excellent business resource centres in your province. Look in the blue pages of your phone book, under provincial government, and then under the small business department. Look for the closest Canada/Provincial Business Services Centre.

Public libraries • Your public library is an invaluable source of business ideas, opportunities, and information. The business reference librarian will help you gain access to an extensive range of information relevant to your business interest. Many public libraries, depending on the size of the community, have a full range of business-related books, catalogues, directories, trade publications, magazines, and newspapers.

Trade shows/conventions • Trade shows can be an excellent way to examine the products and services of many of your potential competitors. You will have an opportunity to meet distributors, franchise companies, and sales representatives. You will also learn of product and market trends, and identify potential products or services for your small business venture. You will find trade show information in the trade magazines servicing your particular field. Also look at the annual directories that publish a listing of trade shows in Canada and the United States. Trade shows also offer an excellent opportunity to stimulate creative thinking. You are exposed to speakers, panelists and displays. You also have an opportunity to exchange ideas with other people attending.

Traval and hobbies • Whenever you travel, look for business ideas and opportunities. Many services and products may not have been introduced in Canada. You may be able to negotiate exclusive or non-exclusive Canadian distribution rights for a product. Alternatively, you may wish to duplicate, with modification and improvements, the product or service. Think of the areas relating to your hobbies or leisure activities where you believe a need exists. You might be able to devise creative ways of meeting those needs.

Categories of opportunities
In summary, when you are looking for potentially profitable opportunities, it is helpful to review some of the main categories of business opportunities:

- providing an information or consulting service
- identifying new opportunities arising from your current business
- becoming an agent, supplier or distributor for someone else's service or product,
- taking existing local products to new markets within Canada,
- transferring concepts from one industry to another
- buying an existing business or franchise
- imitating successful services or products
- becoming an agent or distributor for a product imported into Canada
- inventing a new product
- capitalizing on a growth trend
- solving someone else's problem
- rebuilding, repairing or adding to an existing product or service
- identifying specific target groups and customizing services or products for their needs
- exporting Canadian products to other countries,
- finding productive uses for waste materials,
- catering to a market that is no longer being serviced,
- replacing imported products,
- and targeting a small portion of a large market

Don't forget to invite the candid input of friends and relatives on how good a fit the business concept is for you. Inquire from those in the industry on the viability of and need for the business. ❑

Douglas Gray LLB is a Vancouver-based speaker, lawyer, columnist and author of 15 business books plus a real estate investment software program. His books include Home Inc. The Canadian Home-Based Business Guide *and* The Complete Canadian Small Business Guide *(both by McGraw-Hill Ryerson),* Start and Run a Profitable Consulting Business *and* Marketing Your Product *(both by Self-Counsel Press).*

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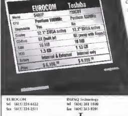

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Sound Forge 4.0

*Continued from page **79***

bug in their software at all, but is a limitation of the codec) was an anomaly in the way the program deals with Voxware's RT24 codec as found in Netscape Navigator 3.0. In other audio applications, such as the Recorder applet that ships with Windows 95, it is possible to save an audio file in the ultra-compressed Netscape RT24 format (which, if this is a meaningful comparison to you, happens to be about 25 percent the size of a RealAudio file, while offering considerably higher fidelity).

RT24 encodes files at 8KHz. Sound Forge, however, apparently thinks that the RT24 output file's sample rate ought to be whatever the source file's rate was, for example 22KHz. This makes the resulting file sound very peculiar, with a sort of Donald Duck voice quality that is as amusing as it is awry. Fortunately, there is an easy workaround: just convert the file to 8KHz before saving.

I'm sure there must be other bugs in the program somewhere, but it seemed remarkably robust and trouble free in my tests. I tested it with both half and full-duplex audio drivers on an AWE32 sound card. The software supports any Windows-compatible sound card.

The program comes with a considerable array of special effects functions, but audio pros will probably want to add some of the plug-ins that Sonic Foundry also offers. I tested the optional Noise Reduction (US$249), Batch Processing (US$199) and Spectrum Analysis (US$149) plug-ins.

Now, there are undoubtedly plenty of audio engineers who would like nothing better than a spectrum analysis plug-in, but for many audio pros, the Noise Reduction plug-in will be the must-have one in this group. It provides a couple of main functions, all fully customizable, that fall into two main categories: hiss reduction and vinyl restoration. (The basic Sound Forge package also includes a Noise Gate function that can eliminate low-level ambient noise or hum.) The former proved useful when I digitized some material from existing audio tapes, while the latter is analogous to Photoshop's "dust and scratches" filter, and is useful for removing pops and tics from those stacks of wax.

The Batch Converter plug-in is, of course, a great timesaver when converting tens, hundreds or even thousands of files to a different format. It's a one-trick pony, but it is a useful option.

The Spectrum Analysis plug-in performs a Fast Fourier Transform of sampled data and transforms the data into a graphical format in one of two formats: a spectrum graph or a sonogram display. It is designed for analyzing vital frequency content in digital recordings. Spectrum analyzers are used in many ways, from simple EQ analysis to acoustic engineering of a musical instrument, recording studio, concert hall or other architectural and scientific applications.

There's a fine line that audio processing applications have to tread between feature-richness and "featuritis," and Sound Forge 4.0 has not faltered. It's the Photoshop of the pro audio world.

Highly recommended. ❑

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Despite the continued plummet of computer prices, it's not uncommon to come across someone so loyal to their old computer they would rather upgrade only those bits and pieces necessary to keep almost current. And keep current is the name of the game in computing, as anyone well knows who's ever tried to even donate a 286 or an Apple II to their local school system.

Older computers are patently unwanted. Not because they don't work, but rather because they don't work well—or at all—with any of the newer, resource-hungry applications that are now commonplace even in the home.

If you could, for example, hook a CD-ROM drive up to your old reliable 286, chances are you wouldn't want to use it because absolutely everything would run achingly slow. So slow, in fact, that the benefits of CD-ROM animation abilities might escape you entirely. Even those with considerably younger machines are running into that same problem of slow system speed as the sophistication of even word processors looks for greater and greater resources in order to properly operate.

Such considerations have led to the evolution of a whole new industry in which third party and, to some degree, original equipment manufacturers (OEMs) are making replacement upgrade parts ever more available as an alternative to deep-sixing your old machine. More RAM, of course, has always been around, but bigger hard-drives, faster CD-ROMs, more efficient video cards, video card add-ons and even motherboards and CPUs are now available at prices low enough to make upgrading an alternative worth some serious consideration.

Desktop owners can take such upgrades for granted because their machines are of primarily modular design—out with the old, in with the new. But, until recently, portable users have been essentially trapped in a "be-happy-with-what-you've-got-or-buy-a-whole-new-system" bind.

CPU upgrades: possible and practical
Of course, many OEMs have offered larger hard-drives and extra RAM for their portables for quite some time now and for the longest time trusted in PCMCIA technology to look after everything else. But the prices have always been suspiciously prohibitive and, even if you were willing to spend the dough, the improvement in overall performance was generally disappointing.

The owner of a once nifty SX33 notebook or even a DX2/50 could spend quite literally thousands of dollars on storage and RAM only to see fractional increases in system speed. When it came right down to it, only a newer CPU could make any other component upgrades really worthwhile. And only a handful of OEMs—or third parties, for that matter—were offering that option.

Savvy capitalists recognized the potential gold mine associated with upgrading notebook CPUs, but had to wait until somebody figured out a way to actually mine it.

Where's the PGA?

The problem you see lies in the way most notebook manufacturers elected and continue to construct their machines. A desktop motherboard holds the CPU in a seat called a PGA socket.

It's that sizeable square you might have noticed inside your computer that has hundreds of neatly arranged little holes all around it. If you want to change your CPU, the physical aspects boil down to simply lifting or pulling the chip from that socket and then simply pushing another one in.

However, only a very few notebooks were built with PGA sockets on their motherboards. (In fact, if you happen to own one of the very few that has—and you should call your OEM to triple check—a Canadian company called Gainbery Computer Products has the chip for you: a do-it-yourself notebook CPU upgrade called the MAXimizer 586 that fits virtually all PGA-equipped notebooks as long as your original CPU is a 486. Call them for details and check out the *TCP* July '96 write-up online at http://www.tcp.ca.)

But it's more likely your notebook CPU is mounted in what is called a "four-corner carrier package" or a "square-quad flat pack" (or somesuch), which basically means it's been soldered to the motherboard and, according to the OEMs, will never (read: NEVER!) come off.

➤

Upgrade update

Gainbery has introduced a new line of home upgrade chips for desktops called the GB686G series. All are overdrive chips that replace your CPU and each is specifically designed to boost the performance of Pentium 75 MHz, 90 MHz and 100 MHz machines. The entire GB686G series is based on "true" Intel Pentium processors with power conversion adapter and integrated heat sink fan.

The three products in the series are:

GB686G 150 • This chip upgrades the Pentium 75 MHz to a 150 MHz.

GB686G-150+ • This upgrades a Pentium 90 MHz to a 150 MHz.

GB686G 166 • This chip upgrades a Pentium 100 MHz to a 166 MHz.

I just happened to have a 100 MHz motherboard in search of a CPU, so I recently installed a GB686G-166 into it, and have experienced no problems whatsoever.

As mine was a chipless board to begin with, I was unable to run any comparison tests. However, I can say with confidence that the computer is very speedy and has so far run without bugs or idiosyncrasies of any kind.

Estimated street prices for each chip in the GB686G series were not available at the time of writing as the product had just begun shipping through Gainbery's new alliance with Merisel Canada.

Also, Gainbery has just announced an even newer chip called the Booster 200, which promises to upgrade a Pentium 100 MHz to 200 MHz. Look for a comparison between that and my new GB686G in a future issue of *TCP*. —*RM*

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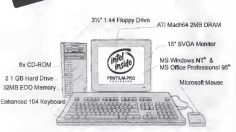

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The skeptics among us may immediately suspect that the main reason for that is OEMs quite simply want you to have to buy a whole new machine. Which is where those ever-optimistic entrepreneurs enter the picture—a Swedish entrepreneur to be exact, who started a company in 1992 called Inter Micro Services. It turns out that somebody in Sweden came up with a device called a "hot jet" that can un-solder those pesky notebook CPUs without damaging either them or the motherboard. Of course, it can also put new ones back in.

Amazingly, this most impressive instrument looks like nothing more than your standard hand-held soldering iron but with several significant differences over that found at your local hardware store. The tip is designed to fit completely over the CPU and protect it while the edges that actually touch the motherboard force super heated air onto the solder to melt it. That's the beauty of the hot jet tool: only the solder receives any of that potentially damaging heat—the CPU and the motherboard are anaesthetized during the entire operation. Once the solder is melted, the hot jet lifts out the CPU and the process is repeated in reverse to connect the new chip.

Don't try this at home

Computers being what they are, there are of course BIOS and jumper settings to consider once a new CPU has been inserted. And, too, different computers will only work with specific upgrade chips. Which means this is not something any normal person, even if they managed to find a hot jet tool for sale somewhere, would want to do at home. Even the Gainbery upgrade package for those socketed machines makes mention of potential jumper and BIOS alterations, albeit in a frighteningly fleeting manner.

Which is where a company called Platinum Upgrades steps comfortably into the picture. Directly connected with the original Inter Micro in Sweden, as well as with a subsequent American outlet called Corporate Upgrades, Platinum Upgrades opened up this past summer in Vancouver to what promises to be an eager and hungry Canadian notebook market.

Bitten by the promise of notebook modularity

A few years ago, a TCP editor bought a high-end 386 notebook PC thinking he was beating the obsolescence trap. The notebook PC was a slick, modular design with replaceable components. It was one of the first models with an affordable color screen, albeit passive matrix but that was upgradable to TFT. The hard drive was also removable and replaceable for those of larger-capacity, and the 25 MHz 386 was mounted on a separate card that could be replaced with another card holding a then-advanced 25 MHz 486 chip.

When the hapless editor went to upgrade the various bits and pieces, however, he encountered recurring sticker shock. The 486 upgrade card was priced at about $1,400 at a time when 486 upgrade chips for desktop computers cost about $500. Hard drives of various capacities were at least double the cost of drives of similar capacity for a desktop machine.

The real shocker, however, was the screen upgrade: about $2,000 for the TFT screen. This was two-thirds the original cost of the entire computer. As a final irony, prices of brand-new 486 notebooks had fallen by this time to around $2,500.

— DT

Where others have offered third-party hard drives, batteries and RAM to portable owners for quite some time, Platinum Upgrades (and the associated Swedish and American companies) are unique in offering all those things *plus* upgrades to the CPU for virtually any portable—from the lowly 286 and up.

And the best part of the whole thing is that they're the only company that will do the work for you. You call them up, choose the upgrade you want—or that your machine will take—book a time slot, send in your machine and it comes back a few days later completely done. The parts are installed, motherboard settings adjusted and BIOS appropriately altered so that everything works the way it should right out of the box.

How high can you go?

However, keep in mind that how far you can upgrade your computer and how many choices you have depends directly on what your computer is now and its OEM configuration. Chip-wise, 286 portable owners, for example, can choose between a Cyrix 486SLC/2 or an IBM 486SLC/2.

Owners of 386SX portables, on the other hand, have four CPU choices, from 486SLC/2s through to IBM's 486 Blue Lightening. Anyone whose machine is already 486-based, however, can reach even higher to the 586 chips.

Hard drives and RAM are a different story. Notebooks from the 286 right up to the 486 can have almost any capacity they want in a 2.5 inch drive, from 340 MB to 1,200 MB. Laptop owners—having that much more space inside—get to go as high as 1600 MB in a 3.5 inch drive.

"The differences in what we can do with different portables," explains Scott Knight, ex of Corporate Upgrades in the U.S. and now president of Platinum Upgrades in Canada, "are dictated by the technology that's gone into the original machine. The 386 DX, for example, had a full 32-bit interface built into it where a 386 SX had only a 16-bit interface. That limits us to being able to use 486SLC/2 chips with an SX machine but we can put the 32-bit IBM Blue Lightening chip into a DX because it's pin compatible."

The 5x86

Knight says 486SXs or DXs can be upgraded using an AMD 5x86 chip, which isn't a true Pentium upgrade, but a variation on the 486 design that's been refined to work like a Pentium. "What they've essentially done is they've taken a processor that's designed with a 64-bit interface and they've crammed it into a 32-bit interface so that it plugs into a 486," says Knight.

"Internally you're getting 64 bits of processing capability but you're still running on a 32-bit bus. That's very important for us because the chip has been designed around the architecture of a 486 machine. So as long as we can get something that's pin-compatible, then we can just solder it right in there and make any adjustments elsewhere on the machine that are required."

Outside of those Pentium-like characteristics, the way the 5x86 chip works is by quadrupling the speed of your motherboard's bus.

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For example, the installation of a 5x86 will (theoretically) result in a relative performance enhancement of four times 33MHz, equalling 133MHz. This makes your machine (theoretically) roughly the equivalent of a Pentium 133. Of course, the increase in performance isn't exactly linear—your machine will not actually be a Pentium 133—because the chip is still forced to work through your original 33MHz bus. However, having been maximized for that application, the chip will squeeze the maximum possible out of the motherboard's limitations.

Considerations of pin-compatibility, bus speed and architecture are what, in the end, make it impossible to convert your old 386 or older 286 into a 5x86 machine, though both can be comfortably upgraded into the 486 class. Knight notes, however, that many of the 486 chips for 386 machines have been discontinued by manufacturers because, in Knight's opinion, they want to move on and leave such technologies behind.

"I don't think you'll ever see a manufacturer," he says, "go as low [as] making a 586 compatible with a 386SX. There is one chip that's compatible with the 386DX, the IBM Blue Lightening, which is a 486 enhanced like the 5x86 that's compatible with some 386DXs."

Knight says, even though the 386DX has the same size socket as a 486, they are not pin-compatible with the 586 so that upgrading generally isn't possible. As well, the 486 incorporated an internal cache that required additional pins as well as other enhancements that aren't facilitated in the 386.

"It would be possible to get around such things by making some kind of interposer [a transposing mount that sits between the chip and the motherboard]," says Knight, "but at this point it's just not economically practical."

Happy be they with an SLC, curses to the simple SL

Even 286 owners out there have some options (as mentioned above), but Knight advises against most because the cost-benefit ratio simply isn't high enough. Also, anyone who bought a notebook with an SL processor—not to be confused with SL Enhanced—is completely out of luck because nobody makes a compatible chip.

In simplest terms, it's economically possible to upgrade your 286, 386SX or 386DX to a 486SLC/2, upgrade your 486 to a 586 and upgrade your Pentium to a 686 (which is Cyrix's "overdrive" chip for enhancing the performance of Pentium-based machines. AMD also makes a Pentium "overdrive" chip called the 5k86).

Hard drive upgrades possible and practical

It is to be expected that changing the CPU in a machine never intended for such interference is a necessarily complicated process. But as Knight explains, even the ostensibly simple hard-drive upgrade is fraught with peril for the frustrated notebook or laptop owner.

"One thing that you find when you start putting new drives into laptops and notebooks is that the machine might not accept the fact that you've changed the drive. This is where the BIOS modifications come in. We actually go in there and change the drive table to suit the parameters of the drive that we've installed. In many cases, the machine is FLASH ROM equipped so new drivers for the hard drive simply have to be installed. In as many other cases, though—and all the old Toshiba laptops are particularly notorious for this—you literally have to burn a new BIOS for the machine because their ROM chips are unalterable.

The drive table for a desktop PC might have 40 or more entries that will accommodate many different hard drives," says Knight. "In notebooks, and particularly in the old laptops, however, there might only be four entries—and only for 40 MB or 60 MB hard drives.

Some hard drive upgrades can be done at home, but only those in machines with FLASH ROM and for which the manufacturers will provide the ROM update."

Knight says the market for hard-drive upgrades is good, because the 2.5 inch technology is relatively new, so many notebooks produced just two or three years ago have only 210MB or smaller hard drives.

"Now a lot of people are looking for that larger capacity because it's one of the most obvious limitations in the portable machine," he says.

Video upgrade, forget it

Moving on, Knight also considered the possibility of other upgrades for portables outside of the mainstream upgrades to RAM, hard drives and now CPUs.

"We're currently trying to research as many as we can of the weird little things people are making for notebooks like PCMCIA CD-ROM drives, replacement batteries and such. But the number one thing that people really want to know—because we're largely dealing with older 386SX and ➤

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DX machines—is whether we can upgrade their old monochrome LCD screens to color That's a really big thing with people but it's just not possible because of the way the video chips are built into portables and the way the LCD screens operate "

The upgrade path in general

Knight is confident that the enterprise undertaken by his new Canadian company is a practical solution to both portable prices and the current market:

"One thing I think is happening—and it's true with anything to do with the computer industry—is that people are procrastinating on buying new stuff So if someone can offer an upgrade say taking a 486SX 33 with a 200 MB hard drive and making it a 5x86 with 540 MB for under $1,000 then people are thinking "I can spend under $1 000 on the machine now It will last me a couple of more years and then two years down the road those Pentium machines that are on the market now at $7 000 are going to be down to the $2 000 level which in the long run will save me two or three thousand dollars."

I can't think of any portable that there quite simply is no upgrade path for. The big question is whether it's economical and the performance improvement is going to be worth it.

—**Scott Knight**

Running through a whole slew of idiosyncrasies that have to be dealt with for specific brands—and even specific models of specific brands—Knight sums up the whole issue of upgrading portables in its simplest terms

"There's no computer out there where we'll have to say 'No There's nothing we can do ' There are some brands for which memory is extremely difficult to source, for example but I can't think of any portable that there quite simply is no upgrade path for The big question is whether it's economical and the performance improvement is going to be worth it "

A very good warranty

Besides the complete upgrade service Platinum Upgrades offers several very attractive warranty arrangements

First they guarantee their upgrade work and the components for a full year. Next that warranty can be applied internationally so you can have repairs made free of charge in Canada the U.S Sweden (of course) and Germany Further, Platinum Upgrades offers what they call a 30-day "downgrade" warranty so if you're just not happy with the performance of your upgraded machine they'll put everything back exactly the way it was before they started at no charge and give you your money back

And finally Platinum Upgrades alone—Inter Micro and Corporate Upgrades are not included in this—are willing to assume any warranty remaining from your OEM

Given that changing the CPU will almost assuredly void the OEM warranty on any machine new enough to still be covered by one Platinum Upgrades is prepared to assume the responsibility of repairing any non upgrade related problems that your OEM would have fixed for the remainder period of original warranty coverage Of course it's anticipated that such situations won't arise very often because they expect to be dealing with machines beyond the age of warranty coverage. Still, it's nice to know they're prepared to eat all the costs of any unfortunate developments.

Taking the plunge

I elected to seize on the opportunity presented by Scott Knight and had my loyal and trustworthy vintage '93 NEC Versa E DX2/50 notebook with a 205 MB hard drive worked on

Though I had been very happy with its performance over the three years I'd been using it I was getting more and more frustrated by its lackadaisical performance as I flogged it into doing more and more Windows 95, for example, took a full two minutes and 26 seconds to boot up from off to completely ready-to-go (i.e. hard drive stopped running) and many normal word processing tasks seemed frustratingly slow

Benchmarks for the CPU and FPU as measured by Landmark 2.0 both before and after the upgrade were:

	Before	After
CPU	169	404
FPU	248	834

I also had a Quantum Europa 540A hard drive installed to replace my Seagate ST3592AG 205 MB drive Though my original hard drive was returned to me, I am not able to use it because the replacement unit had to be mounted in the original NEC shuttle mount However a full file transfer to the new drive was included as part of the service Norton SysInfo 7.0 benchmarked the hard-drive performance at 8.0 for the original Seagate and 11.2 for the Quantum.

Platinum Upgrades' prices for these items (all services included) are $498 for the CPU upgrade and $398 for the hard drive

The overall result in terms of practical living is that Windows 95 now takes one minute and 33 seconds from off to completely ready to-go A few simple calculations show that this amounts to a speed increase of about 65 percent, which is consistent with the benchmark numbers.

Though somewhat less of an improvement than both Knight and I had hoped for my Versa is now noticeably faster and combined with the larger hard drive it is eminently more practical as a working machine I think I'll keep it for a while longer ❑

Contacts

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Portable computer expansion cards come of age

BY GEOF WHEELWRIGHT

The popular PC Card (formerly known as PCMCIA) technology used in most mobile computers is finally giving notebook systems a chance to boast that "anything you can do, I can do better" when compared with desktop systems—albeit at a higher price.

And when you add docking station options into the comparison, there is little to choose (at least on a feature-by-feature basis) between a portable computer and a desktop. In fact, many users who would have, in the past, bought a cheap desktop and a cheap notebook for mobile computing may find that just getting a new high-end notebook with the right combination of docking station and PC Card add-ons could actually save them time and money.

There is no time wasted in keeping data synchronized between a desktop and mobile computer system—and there is only one computer to maintain and update.

So makers of today's mobile systems often claim that, with the vast capacity of their storage devices, the increased quality of their screens and the amount of memory they can offer, even the smallest notebook computers can keep pace with the power of desktop systems, while offering better value than a low-end desktop/notebook combination. And with the advent of thin film transfer (TFT) flat screen display technology, these systems can also provide color VGA-compatible displays that are easily as good as many conventional cathode ray tube (CRT) screens.

A brief history of notebook add-ons

The real sticking point in designing portable systems that offer desktop power, however, has traditionally been in providing the same kinds of expansion options. Notebook computers have achieved their small size at the expense of eliminating either IBM XT or AT-compatible expansion slots from the design.

Until the early 1990s, most portable makers suggested that, as the vast majority of laptop systems included facilities for an internal modem, two serial ports, one parallel port, an external video socket, keyboard connector and internal RAM sockets for expansion to 32 MB or more, you really didn't need expansion slots.

But that argument did not fly when you wanted to connect the personal computer to a local area network (LAN) or add capabilities to allow it to use a CD-ROM drive or play back sound files and movie clips. Two strategies have evolved for dealing with this problem: the docking station and the credit card-sized PC Card (also known as the PCMCIA card).

The docking station was the computer industry's first answer to the problem of notebook computer expansion. It typically was a device that you added onto the back of your notebook computer (or a housing into which you inserted the computer), which provided the ability to house industry-standard expansion cards, an extra floppy drive, an extra hard disk, tape backup drive or a CD-ROM drive.

These docking stations allowed people to use their computers on the road and, when they came back to the office, plug into a single device and immediately have access to all the facilities you would typically expect in a desktop system. But because docking stations generally had to be designed with only a single make or model of computer in mind, they never really achieved great economies of scale—and even today require that you pay a considerable premium over the price of the basic notebook computer in order to achieve this expansion route.

A halfway house between putting expansion into a notebook computer and having it

Continued on page 89

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on the docking station is the quite popular "port replicator" a smaller style of external add-on that allows some smaller notebook computers to have ports that would be too hard to fit into their standard internal design (such as a network connection) Port replicators are also sometimes used to consolidate the connections needed to hook up a notebook computer to desktop computing facilities

All the necessary connections to the LAN the printer and the modem are made to the port replicator which stays at the desk when the user takes the notebook computer home at night A single connection joins the port replicator and the notebook so that all those facilities can be instantly connected when the user returns (rather than having to individually reconnect the printer cable modem cable network cable and so on) But the port replicator was still not an ideal solution

The PC card arrives

This was one of the main reasons that manufacturers subsequently got together and designed something that is now known as the PC Card standard—and why virtually every major make of modern notebook computer now comes with room to accommodate two PC Cards

The PC Card standard was developed by the Personal Computer Memory Card International Association (PCMCIA) The PCMCIA expansion slot is basically a 68 pin tiny replica of the AT expansion bus used in most desktop computers

PCMCIA was formed in 1989 as a non profit trade association aimed at establishing a worldwide memory card standard for the PC industry The standard defines the size pin assignments electrical requirements protocols and file formats of credit card-sized PCMCIA add-on cards More than 130 manufacturers semiconductor companies, software suppliers and systems integrators have joined the PCMCIA since its establishment

The latest and greatest

PC Cards have evolved tremendously over the past few years, to the point where you can do some truly amazing things with a notebook computer just by slipping in one of these cards In the United States, for example Toshiba recently introduced some quite unique PC Card offerings that make this point

They include the Audio/Video Capture PC Card (part of its Noteworthy add-on range) which allows full motion audio and video capture and playback, and the Wireless LAN PC Card with an accompanying mountable Access Point to provide mobile users instant access to an existing LAN In addition, Toshiba has recently exhibited its planned Global Positioning System PC Card

The Toshiba Noteworthy Wireless LAN PC Card and accompanying Noteworthy Access Point are supposed to allow mobile PC users the benefit of LAN connectivity without the burden and inconvenience of wires The Wireless LAN PC Card uses advanced radio-frequency communication to provide flexibility and speed in the placement and movement of LANs But it's not cheap The PC Card with a suggested retail price of US$675 debuted this summer in the U S

Meanwhile the Access Point for Wireless LAN PC Card allows a notebook PC access into a wired network. The Access Point is usually mounted to a wall or ceiling, allowing for instant wireless connectivity Toshiba is promising it offers cost effective compact and reliable" connectivity to those who frequently change locations or reside in difficult wiring environments, such as old buildings temporary installations and open areas where wiring is difficult or impossible The Access Point with a suggested retail price of US$1 995 went on sale earlier this year

A more fun pocket-sized add-on is the Audio/Video Capture PC Card, a technology that Toshiba says will provide 30-frames per second (fps) full-motion video at a 320x240 reso ▶

Trumpcard
The Jack of Diamonds TrumpCard from Guelph Ont. based Ostech Communications Inc combines a 28 8 faxmodem and a 10Base-T or 10Base 2 Ethernet connection The modem is also cellular-ready with an optional direct connect cellular phone cable Contact Ostech Tel 800 563 2386

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lution sound and high resolution 24-bit color still images for presentations video conferencing and portable capture applications. Once installed Toshiba boasts that the card will allow mobile users to capture live-motion video and sound directly from their video camera VCR and TV incorporate the clips into Windows applications and playback on a multimedia notebook PC

Finally the most "whizzy" of all is the Toshiba Noteworthy Global Positioning System (GPS) which Toshiba calls "a personal navigation tool" and which includes the NavCard which Toshiba claims is the world's first GPS receiver in PCMCIA Type II format, a detachable antenna, and a remote extension cable with magnetic antenna mount. The PC Card uses navigation software to convert satellite data from a constellation of 24 satellites into accurate position information in terms of latitude and longitude. The GPS software operable in a Microsoft or Windows environment maps an exact location and displays it on a notebook PC screen The kit has a suggested retail price of US$599

According to Wylie Ehrke the director of accessories for Toshiba's U.S computer operations a key feature of the GPS is its ability to provide street-to-street instructions that direct the user to an exact location At the same time it allows the user to identify with tags and icons the key places that he or she may wish to remember

While these may be fun add-ons there is a psychological issue that gives docking stations an edge over PC Cards for some users particularly in corporations They question the wisdom of paying several hundreds of dollars (typically between $100 and $500) for add-ons that bring capabilities to handheld computers that they can get much more cheaply in desktop systems In addition, some users don t like the idea of having expensive add-ons so small they can easily be lost through a hole in a suit jacket—or even left on the bus by accident

The multi-function PC card

One problem with PC Cards is that they have become victims of their own success There's now such a wide range of add-ons that can be installed via PC Cards that the limits of the original PC Card design concept are being reached

Most notebook computers come with only two "slots" for PC Cards, which users would typically fill with add-on modems network adapter cards, sound cards or CD ROM add-ons. When you look specifically at the communications arena the demands are even more intensive with users being enticed to install cards that will do everything from providing paging capabilities to acting as a secure, physical "key" to lock out other users from both viewing intercepted data transmissions or working with a stolen computer

Like the desktop computer users of the mid-1980s today's notebook computer users are now looking at new-style multi function "combo cards"

Toshiba
Typical of modern docking station design is Toshiba of Canada's Desk Station V available as a $1 000 option for the company's Tecra line It includes a PCI system bus built-in SCSI-2 port two Type III PC Card slots stereo speakers and a swappable drive bay Contact: Toshiba of Canada Tel 800-470 3500

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as a way of getting around the two-slot PC Card limitation. By combining several functions onto a single card users are thus able to equip their notebook computers with more capabilities.

One of the organizations at the forefront of this multi-function card development effort is Motorola's Information Systems Group. According to Mike Pun, product line manager for PC Card modems for Motorola Information Systems, the key is to make these products more than the sum of their parts and really add value to the notebook computer.

"We are looking at [ways of adding] extra value in PC Cards," he explains. "Our latest product, for example, has security and authorization functions built right into the card."

The product is known as the Motorola SecurID Modem, a multi-function PC Card that combines Motorola's 28.8 modem technology with SecurID network authentication from a company called Security Dynamics. Motorola says the SecurID Modem is designed for businesses that need to cost effectively enhance the security of their existing network system, as well as the authentication of their users accessing remotely.

"As more workers extend the boundaries of their offices via remote modem access—and as more companies link to the Internet—unauthorized user access to computer and network resources has become a growing concern among businesses today," says Christine Cantarino, director of Special PC Cards in the company's Mobile Computing Products division.

"At the same time, mobile users require high performance modems for fast, convenient anytime/anywhere access to their corporate networks. SecurID Modem is the first product available that fully addresses both these requirements as a single cost-effective PC Card."

Motorola and Security Dynamics boast that SecurID Modem is the first PC Card to provide compatibility with Security Dynamics' ACE/Server network security software and hardware or software Access Control Modules. The SecurID Modem is designed to provide two kinds of immediate authentication (to ensure that the network can be sure of the identity of any user logging onto it): a memorized personal identification number (PIN) and a randomly generated access code (produced by the modem itself) that changes every 60 seconds.

To access a protected network, the user simply enters the secret PIN at the password prompt. The combination of the user's PIN and the SecurID Modem's randomly generated token code create a highly secure "one time password."

By eliminating the "reusable password" as part of the authentication scheme, Security Dynamics is hoping to eliminate the problem of password abuse. The modem is just one of a number of multi-function PC Cards produced by Motorola.

According to John Wagner, technical marketing manager of Motorola's Mobile Computing Peripherals division, the whole trend towards these kinds of cards can make a big difference to notebook computer users.

"As the demand for multifunction PCMCIA cards grows—and as manufacturers incorporate more advanced wireless functions and new applications like ISDN, videoconferencing, and motion video capture into PC Cards—the challenges for multifunction card designers increase dramatically," he says. "Most of the notebooks we use today have only one or two PCMCIA slots. This simply is not enough to meet our needs for modem, wireless network, sound, SCSI and storage cards. Also, today's mobile professional requires different communication solutions when on the road, in the office or working at home."

He says that if PC manufacturers added more slots, the size and weight of notebook computers would become unwieldy and battery life would decrease. "Consequently manufacturers have turned to another approach—designing multiple functions onto a single card," explains Wagner.

Wagner estimates that there are approximately 37 different types of PC Cards available at the moment and suggests that the fastest growing communications segment for PC cards includes fax/modems, LAN adapters and ISDN. A critical product type in this group of PC Cards are multifunction LAN/fax/modem interface cards, he adds.

A good example of this type of multifunction PC Card is Motorola's new Mariner, which combines wireline and wireless communications capability in a single high-performance card," Wagner says. "Mariner provides mobile users with high-performance LAN access for Ethernet networks, a modem for remote access to corporate networks, e-mail and the Internet—as well as wireless connectivity to leading cellular phones and even Motorola pagers." ❑

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Internet via Windows: An Introduction

David

Saturday, September 28, 3:00-5:30pm

Let the Internet Learning Centre teach you how to use free Windows-based software to get point and click access to the people and information available in cyberspace. David S. Rostoker, a B.Comm, CMA, CDP, Toronto consultant, speaker, and lecturer with the Internet Learning Centre will show how easy it is. Learn how to use e-mail, join electronic discussion groups, retrieve files, access the World Wide Web, and more.

Design Your Own Web Page

Sunday, September 29, 3:00-5:30pm

It's easier than you think to promote your own business or interest on the Internet by designing your own world wide web page. Learn the basics from David S. Rostoker with the Internet Learning Centre. He gives an overview of how the World Wide Web functions and how to create web pages with HTML (Hyper Text Markup Language).

Doing Business on the Internet

Sam Sternberg

Friday, September 27, 6:30-9:00pm

Learn how the Internet can make your business more effective and profitable. Sam Sternberg with the Internet Learning Centre shows how to lower your costs, increase your market, and simplify your operation. Learn how to use World Wide Web pages to sell in a global marketplace. You'll discover Internet tips and techniques for international communications, advertising, and research. Sam is a co-founder of the Toronto FreeNet, a journalist, a teacher and author of "The Business Guide to the Internet"

How to Repair Your PC

Sunday, Sept 29 11:30-2:00

Myles White

Myles White, associate editor of ***Toronto Computes*** and contributor to the ***Toronto Star's*** Fast Forward section, teams up with computer consultant and former partner Walter Gollick of Quality Computerware to show you how to build a system from the ground up, aided by a video camera to see the fine detail. They will help you choose the right components to build your own PC, or upgrade an existing one. Together they have built many systems for clients, learning both basic and advanced tricks of the art, "largely by breaking things first"

Laying the Foundations of a Home-based Business

Friday September 27, 3:00-5:30pm

Stewart Sklar

You can't start a home-based business without some sort of legal, accounting and tax planning. Learn how to do it right from the very beginning. Stewart Sklar, a lawyer, teacher and columnist, will teach you all the important principles of starting your own small business.

Pick a Home-based Business and Get Big Tax Savings

Friday, September 27, 11:30-2:00pm.

Dan White

Interested in cutting the tax bite on your home-based business? Dan White, a Toronto-based consultant and speaker, can show you how many people get by without paying taxes. Learn what you can and can not write off. You'll be shown how to run your business on a shoestring. You'll never think the same about taxes again.

Creating Offshore Wealth

Saturday Sept 28 11:30-2:00pm

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Making your portable less so

Lots of ways to secure that machine... or at least to protect your data

BY ROSS MACDONALD

There's only one really compelling reason to shell out all those premium dollars for a portable computer—it's portable. Otherwise, you might as well save a bundle and get a more powerful machine for about half the outlay.

That constituting a somewhat less than Vulcan grasp of the situation means thieves and layabouts of all descriptions will eventually manage the same logic. Little surprise, then, that Safeware, an American insurance agency specifically geared to covering business computer equipment, reports notebook losses growing from 150 000 units in 1994 to 208 000 in 1995. And that's just among its clients! The numbers aren't even in yet for this year but we can expect at least a similarly proportioned increase, if not an even larger one. And, of course, no one has even ventured to add up how many notebooks are lost in total by private citizens and non-insured businesses combined.

The point is, quite simply, that portable computers, by virtue of their value as well as design, are an easy and tempting target for those who are even remotely inclined to grab for easy money. Of course, the most direct way of stopping such thefts would be to convince all and sundry never to purchase "hot" goods. But, seeing as human beings are involved, that will never quite be realized as an option. Alternatively, however, a whole new industry is just now developing to produce a number of products that will make your notebook a considerably less tempting tid-bit.

Paradoxically, you might never realize just how much thought has gone into this problem from a visit to your local "Mega Computer Warehouse Direct" retail store. I recently visited two such outlets in Vancouver only to find a grand total of three notebook security products on the shelves: two cable lock-down kits and a device that locks into your floppy drive. A quick question or two to a salesman or two wasn't much more enlightening. They'd heard of a variety of other products but didn't know what they were specifically called or where you could specifically get them.

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As an unfortunate function of modern living and a gradually predominant daily ritual, I suited up for yet another trip to cyberspace. There, fishing around for computer security information, I came across a company in Kansas called Innovative Security Products (ISP). It didn't take long to realize that this was a business conceived around the recognition of computer security as a rapidly growing concern. The company's catalogue offers a total of 21 products for protecting computers of all sorts, eight of which are either specifically geared toward portables or equally useful for portables and desktops.

Regardless of who you end up dealing with, you're going to find that computer security products essentially fall into what amounts to three main categories: cable lock down systems, alarm systems, and data protection systems. Each category is relatively self explanatory and all are available from ISP if you want to check them out on the Net.

Cable lock down systems

Cable lock down systems are the most abundant in terms of what's available in the market, likely because the concept is so logical and the execution so straightforward. They're probably cheap and easy to make as well.

As the name suggests, all kits of this type include a cable, a lock and some means of attachment to your computer so you can chain the machine to the furniture while you're elsewhere so nobody else can run off with it—at least not very quickly. The only things to watch for when shopping for one of these kits are the quality of the individual components and the length of the cable—you'd be surprised how short 1.5 metres (five feet) suddenly seems when it's a couple of centimetres (an inch) less than what you need. Prices vary according ➤

The Pearylok anchor attaches to the bottom of a PowerBook or other notebook. Feet are included to raise the computer high enough to clear the anchor, which holds a retractable 4 foot cable. From SecurTech in Oswego, Oregon. 1-800-800-8573

The Smart Anchor includes a small tab that is glued to the computer, plus a five foot cable and brass padlock. From SecurTech in Oswego, Oregon. 1-800 800 8573

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The Safe Notebook Plate from Innovative Security Products in Prairie Village Kansas 913-385-2002

The Safe Notebook Clip attaches to the security slot included in some notebook models from Innovative Security Products in Prairie Village, Kansas, 913-385-2002.

to these factors but you can expect to pay around $20 to $30 for something substantial. a real bargoon if it works

Fortunately manufacturers have considerately come up with a variety of ways in which to attach these kits to your computer too The most common is with a small (maybe three to five centimetres) adhesive plate, much like you might have seen hobbling display units over at the Mega Computer Warehouse Direct The plate sticks to the machine and the cable goes through a loop in the plate around the leg of the nearest furniture then locks with a padlock.

These kits are relatively effective, but any experienced ripper-offer will know that only moderate amounts of brute strength will generally overcome the adhesive and all he'll be leaving behind after a really good yank is the security kit itself The real value of these kits is in deterring those who weren't planning to run off with your notebook but were inexorably drawn toward evil thought by coming across your $7,000 machine sitting alone on the table

Next up in the security hierarchy are cable lock down systems in which the locking mechanism is attached to a plate that inserts into your floppy drive and can't be removed without the key These have the advantage of forcing the would-be thief to destroy the floppy drive if they elect to exercise that same brute force technique These also cross over into the category of data protection systems because they stop anyone from either copying any of your files off onto floppies or introducing any viruses etc via the same route

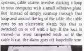
Experienced portable owners will readily anticipate the biggest flaw in this system however, in that many notebooks have removable floppies which if the thief has time to figure out where the release catch is, will be the only thing left sitting on the table when you come back from the washroom. Expect to pay around $30 for one of these (the security system that is, not the floppy drive)

The most secure of the cable lock-down systems are those that attach to a "security slot" that many but not all portables have built-in to the cabinet It's a little slit in the case containing a loop that you'll usually find at one of the rear corners of machines so equipped The cable clips to this loop and, again, around any awkward object and then of course, locks. The only ways to remove a machine protected this way is to use the key cut the cable or seriously break the computer case—the latter rendering any theft for profit redundant

The only drawback here is that only those with security slotted computers can make use of these devices A kit with good quality parts shouldn't cost you more than about $25

Alarm systems

I was able to find two different kinds of alarm systems on the market The first works for both notebooks and desktops and is called a cable alarm Like the cheaper lock-down cable systems, cable alarms involve sticking a loop to your computer with a small adhesive plate But instead of simply running through that loop and around the leg of the table the cable runs to an electronic alarm box that is switched on or off with a key If the lock is moved—or even tampered with—or if the cable is cut the alarm goes off hopefully scar



Proximity alarm one part attaches to the computer the other part stays with you If the distance between the two parts exceeds a certain distance an alarm is triggered from Innovative Security Products in Prairie Village Kansas 913-385 2002

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ingway the thief while warning anyone within earshot. Of course, if you want to move the computer yourself, you simply turn the alarm off and run the cable out of the loop.

The adhesive plate is the only thing permanently attached to the computer. The particular cable alarm sold by ISP adds a tamper-resistant battery compartment thwarting any smarty-pants bad guys who might attempt to simply eliminate the alarm's power source. Again, the real flaw in this concept lies in just how little force is required to pull the adhesive plate off the machine—though at least there'll be lots of noise while it's happening. There are a variety of cable alarms on the market but expect to pay $50 and up.

An alternative alarm system specifically designed for portables on-the-go is called a proximity alarm. A highly specialized item this type of device consists of two parts, a sending unit and a receiver. Either unit stays with the computer and the other stays with you. Though range settings are variable the standard principle is that if the two parts get separated by a distance of more than about 4.5 m (15 ft.) the receiver will start to beep.

A proximity alarm is not really useful for protecting your machine at home or the office but if you do a lot of travelling or have the habit of carry your computer around town it helps to ensure it won't get snatched while you're checking in at the airport or checking out the sales at your favorite store.

Features to look for include a warning signal for when any sophisticated thieves try to turn off the sending unit and a panic button to make the transmitter beep loudly when your computer is misplaced.

Quality is the most essential component in a proximity alarm system. I've heard that the cheaper ones are as idiosyncratic as your household smoke alarm, going off at the slightest provocation—or not going off at all. A good one ought to cost about $50.

Data protection systems

Items in this category don't necessarily thwart the computer thief but they do help make your machine less attractive by rendering your data inaccessible. The most basic of these is the drive lock, a device that quite simply locks into your floppy drive as a variation of one of the cable lock-down systems described above. The only difference here is that this version doesn't have a loop for receiving a security cable. It will however destroy your floppy drive just as completely as if forcibly removed. A drive lock costs about $20.

I am reminded of the famous Canadian tele-journalist Eric Malling whose notebook computer was stolen some months ago. Transcripts of all kinds of *verrry* interesting personal correspondence started showing up in the notorious *Frank* magazine. Even some mainstream outlets began referring to it though the perpetrator was never found.

Sound embarrassing? You bet!

Well a sophisticated escape from such humiliation comes via a choice of data encryption software packages. These effectively scramble anything from individual files and directories to the entire contents of your hard drive. They'll even render the contents of floppies or your network server unreadable. Access becomes virtually impossible without the proper passwords. Better packages will include utilities for locking out specific files directories or drives while allowing others to remain accessible as dictated by you. You should also be able to encrypt any file you want not just those in designated locations or directories.

It's very difficult to recommend one package over any other as the features and interfaces all differ to suit a wide variety of tastes and degrees of paranoia. Expect however, to pay at least $75 for a reliable package.

An oddball or two

A nifty and simple way to identify your very own machine—after it's been recovered by the cops (ha ha)—is by marking it. Some people already etch their initials into a removable component like the battery or hard drive while others go so far as to mar the actual case.

The more sphincterally tense among us however will be pleased to know there's an alternate method of marking your notebook and/or its removable components in a way that doesn't show. It's a special marking pen containing ink that will only show up under ultra violet light. And where you might wonder might you come across some of that unusual light? Well at least one package is available from ISP with a hand held ultra violet lamp included. The pen will write on any surface and is indelible to at least some degree. ISP's kit runs for about $40.

Also for the really paranoid (and secret agents out there), notebook privacy screens are selling in ever increasing numbers. These are removable polarized filters that fit over your notebook screen, rendering it completely illegible to anyone looking on from even the slightest angle. The user can see through the screen perfectly well—as long as they're directly in front of the screen—but nosy airline seat mates and back stabbing colleagues (not to mention enemy agents) will be entirely foiled in their unscrupulous efforts to make personal gain from your personal data. These are relatively pricey items at about $100 apiece. ┘

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Batteries not precluded

A battery of info to keep your portable portable

BY ROSS MACDONALD

Portable owners PAY ATTENTION! all you desktop owners out there can go back to sleep.

Anyone who's been using a notebook—or its insidious predecessor the laptop—for any length of time is bound to have reluctantly made a few confounding discoveries about batteries by now:

1. they gradually grow shorter in capacity;
2. they eventually poop out altogether;
3. the local hardware store simply don't got 'em and
4. those that do got 'em want only slightly more than the monthly car payment for a new one.

Batteries have long been a sore point for portable computer manufacturers as evidenced by their underplay of that limitation in the early days then later trumpeting "extended battery life" or "new power management features" or "five to seven hours from a single charge" as feeble progress in the technology was made.

Of course, it's only after reading the manual you learned that those "five to seven hours" might (maybe, perhaps) be possible if you simply disabled just about every feature of the notebook except the battery warning light.

As portables move closer and closer to becoming viable replacements for desktops, incorporating just about all the same features, power consumption can no longer be swept under the rug nor realized through hyperbole

As portables move closer and closer to becoming viable replacements for desktops incorporating just about all the same features, power consumption can no longer be swept under the rug nor realized through hyperbole. Pentium processors, brighter screens, built-in fax/modems and CD-ROM drives are all hungry for power that just isn't available.

However, serious research is going on even as you read. Thank goodness the nightmare of Ni-Cad (nickel cadmium) has been expunged forever in favor of the current Ni-MH (nickel metal hydride) and looming Li-ION (lithium ion) technologies. But still, battery life, capacity and—particularly—price hobble the true portability of portables. After all who'd care about the battery pooping out every year or so if a new one could be had for $29.95? Reality, however, dictates that batteries actually do poop out every year or so but a new one costs anywhere from $100 to—are you ready for this?—a whopping $600.

Further exasperating all notebookers is that the turnaround for most notebook lines falls well within the borders of a single year. Your latest and greatest full featured portable will be a discontinued, obsolete item before it sees another Christmas. And manufacturers aren't fond of stocking bits and pieces for older models in storage space that could be better used for the latest and greatest whatever.

It is not exactly rare for a faithful customer to call his maker only to discover that not only don't they make batteries for that model anymore but the technician's never heard of it anyway ... 'cause they weren't makin' those when he started there: "Really?! We made those? Lemme just look in the archives to see if I can find a part number." The answer for many has become simply never using the portable more than a cord's length from the nearest outlet.

Battery Tips

1. Be sure to fully charge your battery the first time it is connected. New batteries might require five or six full charge/discharge cycles before reaching their optimum capacity.
2. Periodically clean the battery terminals with a clean, soft, dry cloth. Dirty terminals are a major cause of charging problems.
3. Remove the battery from the computer or external charger when not in use (i.e., when the machine is plugged into the wall).
4. Fully discharge the battery before beginning another charge cycle then fully charge the battery when that new cycle is started. —*RM*

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A fix for that draining experience

But there is an alternative. And a Canadian one at that. Some forward thinking folks sometime ago came up with the idea of actually manufacturing clone batteries or offering to refurbish idiosyncratic originals. Though not unique as an industry, Absolute Batteries in "La Belle Province" has become the major player in the battery replacement field.

Absolute's Jean-Pierre Richer explains that it's simply logistics and cost that keep OEMs (original equipment manufacturers) out of the battery game. The result has been that they actually encourage businesses like Absolute and often refer customers when a battery is the order of the day.

"The life of the product is so short that OEMs will keep inventory only for a certain length of time," says Richer. "If they make a certain model of notebook for six months they might stock batteries for that product for a year and a half. After that it's up to the customer to find a battery through a dealer or distributor or whatever on his own. The problem is storage. If an OEM stored batteries for, say, five years, I don't think I'd want it for my computer anyway because a battery loses part of its life while sitting on the shelf."

Though the existence of replacement battery companies like Absolute is a great relief to our frustrations, it isn't, alas, to our wallets. Third party replacements can actually end up costing the same as a battery would from the OEM—if they had one. "That's because it's very expensive for us to manufacture a battery mould for an older portable," Richer explains. "You're looking at anywhere from $25 000 to maybe $60,000 just to make a mould for a battery. Then we actually have to make each battery after that.

"Also, battery technology is getting more and more advanced and there's a lot of electronic components inside many batteries these days which require a lot of engineering," he says.

Though that might make it sound more practical to concentrate solely on refurbishing, Richer counters that many customers actually want to own multiple batteries to extend their computer's use in the field. As well, with the advanced technology in newer batteries, refurbishing doesn't always work because the electronic circuitry might need replacing, not just the actual cells. "It often ends up a lot cheaper for manufacturers like us to just make a new battery from scratch in the long run," he says.

"And business is very good. The demand is unbelievable. Even though the cost is somewhat high—$100 to $600 depending on the computer make and model—people are less concerned about price than availability.

"At the point they call us, they're more concerned that they spent four, five or six thousand dollars on a laptop and now they can't get a battery for it," he concludes.

Absolute's current catalogue lists replacement batteries for more than 300 notebook computers so, if you're actually facing this dilemma (and you are, even if you don't know it yet), now you know where to go. However, though the company's address and contact numbers are given here, Absolute batteries are sold through retailers—just about any computer store, according to Richer. ❑

Contact: Absolute Batteries, 450 Place Trans-Canada, Longueuil Que., J4G 1N8. Tel: 514-442-3311
Fax: 514-442-2599. Toll-free fax: 800-372-8363

Battery types:

Ni-Cad (nickel cadmium) This is the most common type of rechargeable battery for all applications. These batteries are to be avoided at all costs for use with computers because they are generally low in capacity and are particularly susceptible to developing charge memory despite meticulous conditioning.

Ni-MH (nickel metal hydride) This is the standard for most current notebooks. Ni-MH exceeds the capacity of equally sized Ni-Cad batteries by about 30 percent and is less likely to develop charge memory though that may still occur. Fervent conditioning is still required.

Li-ION (lithium ion) This is the newest technology employed by many notebook manufacturers because batteries of this type can offer the same capacity as a Ni-MH but in a smaller, lighter package. They are also entirely free of developing charge memory. The most immediate drawback is that they are quite a bit more expensive that the others. More insidious than that, though, is the fact that Li-ION remains an imperfect technology and raises a lot of concerns about the environment and the battery itself. One manufacturer has had the particularly fruity experience of having the Li-ION batteries at the core of their newest notebooks actually classified as a fire hazard. Jean Pierre Richer of Absolute Batteries, suggests avoiding notebooks that use Li-ION for the next six to eight months until the bugs have been worked out.

Smart battery: This can be Ni-Cad, Ni-MH or Li-ION, but includes electronic circuitry for such things as serial number recognition, charging and power management. Smart batteries ostensibly offer maximum run time and efficiency.

Sealed lead acid thin packs These external rechargeable battery packs give economical extra run time in the field. However, they are ultimately impractical as they are heavy and have a shorter life than even internal Ni-Cad batteries. —RM

A guide to battery terminology

...erally lifted from Abs...ute Batteries lit...ture, following is a handy guide to ba... terms, types and tips.

Amp hours (Ah) This measurement ...ates the amount of energy a battery ...hold. It tells you how long the battery ... power the computer. Simply put: the ... Amp hours, the longer the running time.

Capacity: This is the same as Amp...

Charging This is the act of putting ... into the battery.

Conditioning This process assures ...mum battery performance through a ... full discharges and recharges.

Cycle life. This measurement m... number of times a battery can be ... discharged. Each discharge and ... constitutes one cycle.

Discharge This is the release of energy ... the battery.

Memory This term describes a battery's ... capacity to constant and repetitious ... but without fully discharging in ...

Milliamps (mah) This measurement ... to capacity. One mah = 1/1000 amp.

Rated capacity This rating is meas... Amps or Milliamps. It is determined by ... manufacturer and used to determine ... run time and warranty specifications.

Self discharge This is the process of th... battery releasing energy even when ... being used. Most batteries self disch... rate of one to two percent a day.

...ge This indicates units of ... pressure. All batte... are ...

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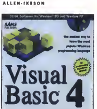
Training wheels for VB4

New book and disc offer Visual Basic basics

BY JEAN ALLEN-IKESON

Visual Basic 4 in 12 Easy Lessons 2nd Ed.	
Author	Greg Perry
Publisher	Sams Publishing
Estimated Street Price	$59
ISBN	0-672 30847 5

Softcover 662 pages plus CD ROM 1996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The theme for the '90s could be "upgrade your skills or you're out!" With that in mind, if you aren't already using Microsoft's Visual Basic 4, you're probably yearning to learn about object oriented programming. Or you may have seen a colleague get a promotion for creating a VB4 modification of Microsoft Excel or Access for a company-customized program, and want in on the success.

Sams Publishing (an Imprint of Simon & Schuster Interactive) has introduced an inexpensive way to get started with Visual Basic 4 and learn how to use it at the same time. Tucked away on software store shelves, the program box should tell you it is a little different when you pick it up. It weighs a ton, and for good reason. Inside is a 900-plus page book in addition to a CD-ROM.

The disc contains a working copy of Visual Basic 4, which looks like and works like the commercial version except that you cannot compile programs for independent usage elsewhere and you are limited to two forms. However, the complete help system from the full copy is included.

The disc is great for writing programs and learning the ins and outs of VB4. The accompanying book, *Visual Basic 4 in 12 Easy Lessons*, contains 12 tutorials with accompanying projects. (The disc contains the answers to the 12 tutorial quizzes.) The writing is clear and detailed without being confusing. Even my programming-addicted 10 year-old finds it understandable.

Indeed, the box claims "no programming experience necessary!" The organization of the book is great and helps you learn basic programming or how to add custom controls to VB programs. Concepts, notes, reviews and tips are segregated and marked to make learning as easy as possible. You'll learn programming concepts such as variables, looping, file controls, and arrays.

Because it is written for Windows 95 or Windows NT, the programs you create are all 32 bit. And it's fun to write your own set up program like the ones you see every time you load a new CD-ROM.

Continued on page 109

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The accessible Web

Industry, associations trying to keep cyberspace barrier-free

BY MICHELLE J SCHOFFRO WITH TANYA BIRD

As the Internet gains popularity the issue of its accessibility follows as its shadow From the boardroom to the classroom people are recognizing the many resources and opportunities the international network offers

However with an emphasis on growth there has been little regard for its structure and organization

Dr Gregg Vanderheiden, in his paper *Universal Access to National Information Infrastructure (NII)*, writes "Currently many individuals are excluded from access to information because of an inability to handle printed material For example individuals who are blind cannot read printed material or individuals who have motor disabilities may not be able to turn pages in books Electronic dissemination of information has the potential to overcome many access barriers.

While opportunities for people with disabilities exist in the digital world like the real world there are many obstacles and barriers to their access—especially on the World Wide Web

"Documents stored in complex proprietary formats or documents requiring expensive hardware or software present insurmountable barriers to access For example, files stored as graphic images cannot be accessed using standard Braille and speech devices " Vanderheiden explains.

In addition to blind and visually impaired people there are barriers to the hearing impaired people with limited motor control and people with cognitive disorders.

Mike Paciello who specializes in Web accessibility, is a consultant public speaker and Web design specialist co-founder of WebABLE and the program manager of Vision Impaired Services at Digital Equipment Corporation

"Print-impaired people also include those who have little or no use of their hands or fingers in order to turn pages of a book or to access a keyboard or mouse interface for electronic documents " says Paciello

A common complaint of numerous specialists in the field is the structure and design of many Web sites Most can only be completely accessed by people with no disabilities using top-of-the-line computer hardware, and high speed Internet service

Peter Field of the Diversity Management Directorate at the Public Service Commission of Canada has coined a term for the potential solution "technology assisted diversity" which involves "finding solutions that enable everyone not just persons with disabilities "

To increase awareness of the problem the Diversity Management Directorate created the Web Page Accessibility Self Evaluation Test, which is a checklist of 20 aspects of Web page design

These include graphics downloadability input forms text photos audio and video clips and even punctuation—all factors that play a role in the accessibility of a site

Yves Seguin of the directorate, says they created the list because "we didn't want to be in the business of monitoring or auditing or policing everybody's Web site for accessibility "

Design consistency is especially important for people with cognitive impairments. A highly consistent style with predictable layout elements throughout a Web site makes it easier for users to navigate through Web pages Even providing the option of text-only versions for people with screen readers to download information means it is accessible to more people.

It is important to break text into smaller units which allows people with learning disabilities or minor visual impairments to grasp the material more easily

Paul Fontaine, of the Centre for Information Technology Accommodation advises "Every graphic image should have associated text...if image maps are used there

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should be an alternative method of selecting options." He explains that "If the person viewing the information is using a character based program (e.g. Lynx) or has graphics turned off in other browsers, the link will be lost."

Ray Ingram of The Productivity Works Inc., prefers a different approach. He suggests that "graphics and images not displayed under user request are the biggest flaw of sites."

Other problems met by people with disabilities trying to navigate the Net include tables and charts, lack of punctuation and audio and video clips.

Mike Paciello says tables are a nightmare for the blind.

"In addition to speech synthesizers, blind users require application software called 'screen access' or 'screen reader' software. Most of these applications are only capable of reading one line of text at a time. Thus, when the browser displays a multi-column document, the screen reader reads each line, jumping from column to column until it reaches the end of the line. This makes it very difficult for the user to follow since there is no logical construct for the screen reader to follow."

He advises organizations, especially publishers of online journals, newspapers, or magazines, to "consider providing an alternative view of your text that is not multi-column in format and that can be downloaded."

Screen readers also run on until they stop at punctuation. Without punctuation, even in headlines, the readers don't stop, which makes text difficult for the visually impaired to understand.

While audio clips found within Web sites often enhance them, if they are not accompanied by transcripts, hearing impaired persons may miss large amounts of important information. Video clips, on the other hand, present similar abstracts to other bitmap images. However, when accompanied by supporting or descriptive texts, the problem for disabled persons is easily rectified.

Major corporate players are devising their solutions to the problem of accessibility. Hardware to software solutions will likely surface over the next year. One such product is a Web browser with built-in access features currently being developed by SoftQuad in collaboration with the Canadian Network for the Advancement of Research in Industry and Education. The browser is expected to be on the market by 1997.

IBM has a Special Needs Solutions division under which it creates the Independence Series TM of assistive devices. These range from a Screen Magnifier (to enlarge text and images) to a screen reader, to convert text to speech for visually impaired persons.

Adobe recently devised an accessibility plan to improve their portable document format (PDF), which is gaining popularity on the Web. While it is great for those with sight, it is difficult to access and translate into a format appropriate for blind users.

The importance of universal Internet access has been highlighted by the decision to make accessibility the theme of the Sixth International World Wide Web Conference, to be held in California, April 7-12.

Since the Internet is still in its infancy, improved access is still within reach. Peter Bosher, project manager of Information Superhighways at the Royal National Institute for the Blind (RNIB) in London, England, says "since the concrete is still wet, now is clearly the time to move." ❑

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Creating an accessible Web site

Here are some elements to consider when creating or maintaining an accessible Web site:

- The design should be consistent throughout the entire Web site. That includes the layout of hypertext markup language (HTML) tags, headers, logos, graphics and text.
- Provide text to accompany every graphic image. ALT text tags or supporting descriptions work well, especially with hypertext links or photos.
- Use an alternative to graphic bullets: another type of character can be picked up easily by screen readers, which many blind persons rely on.
- Many background pictures are not read by different browsers. If using them, provide text for any important information contained in the graphics and be sure that there is a noticeable contrast between the background and the text. This enables those people with poor vision to better read the site (and causes less eye strain for everyone.)
- Give users a choice to download graphics—countless hours waiting simply makes users annoyed.
- Charts and tables create problems for screen readers. Text should read from one side of the page to the other instead of in columns.
- Punctuate headings as well as text. It makes sense of the sentences and captions for people who rely on screen readers.
- Audio clips can enhance Web pages, and where possible, should include a text transcript for the hearing impaired or for others who want a hard copy of the speech.
- Video clips should be accompanied by full descriptive texts or narratives of the contents. *—MJS and TB*

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Sarah McLachlan CD holds surprise for Win95 users

BY KEITH SCHENGILI-ROBERTS

SARAH MCLACHLAN
Rarities, B-Sides, and Other Stuff

Manufacturer	Nettwerk
System Requirements	CD-ROM drive
Price	SRP $16

It had to happen sometime: the seamless merging of music and multimedia in a single music CD. Windows 95 offers software tools to music companies that integrate multimedia with the music tracks on a CD.

Using this software, the multimedia content of the disc is essentially a hidden track which only appears when the CD is inserted into a computer running Windows 95. Anybody who buys the Canada-only release of this disc and has a CD-ROM player and a Windows 95 computer will be in for a treat.

Many people who buy this CD may not even realize that it has multimedia content—it is not listed on the back cover of the CD nor anywhere within the sleeve. That's exactly what happened to this reviewer—after slipping the CD in the CD-ROM drive, the hard drive chugged away for a few seconds and suddenly a menu appeared for the CD-ROM.

The multimedia content is not terribly extensive—it consists primarily of a Sarah McLachlan video of *I Will Remember You* and a full discography of her previous works. The video is displayed in a relatively large window and while the video is as good as can be expected for something that has been heavily compressed to get it onto the disc, it requires a powerful system (486 DX 100 or better) to display things adequately. The video represents the first commercially available enhanced music disc featuring the new QuickTime compression, which means 30 frames per second as opposed to the usual 15.

As for the music, as the title suggests, it is mainly rarities, B-sides and remixes. It is safe to say that any fan of Sarah McLachlan will enjoy this CD—it does not contain any filler. It also works as a good introduction to the work of Sarah McLachlan, featuring a wide range of songs, from simple ballads sung in her gentle voice to good, dancey remixes. Unlike many other B-side collections you are likely to run across, a Sarah B side can be every bit as good a song as some of her A-sides and hit singles.

Rarities, B-Sides, and Other Stuff contains a host of cover tunes (including Joni Mitchell's *Blue*, Billie Holliday's *Gloomy Sunday* and XTC's *Dear God*) and some previously unavailable dance mixes.

Generally speaking, this reviewer (who used to work as a music director at a campus radio station many years ago) finds that remixes come in two different varieties: very good or annoying. Thankfully this CD has more of the former and none of the latter (though the Rabbit in the Moon remix of *Possession* verges dangerously close to the annoying).

People who are likely to buy this CD will do so because of the music, but the added multimedia element will please fans of this fine Canadian singer. Expect to see more of this interesting mix of music and technology in future music CDs. ❑

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I stumbled into them in the form of an over-refreshed cohort vivifying a friend's cafe some days later. Though I spent the evening and subsequent days with them, the only communication we were able to achieve was deeply rooted in the universals, "vodka" and "refugee "

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The EZ Language CD-ROM is very much like a digital version of those foreign language phrase books you might have purchased at some point in your travels. Though touted as "the fastest way to learn a language," this is not an actual language course. Instead it is a collection of phrases and words that you learn phonetically. You might well sound as good as a native when you ask a Muscovite where the toilet is but if he wants to know your opinion of Yeltsin pointing to the toilet will just about stretch all the eloquence you can muster.

Each language on this disc is organized around three main sections called Learn, Facts and of course Dictionary.

Learn is where the action is. Through a pictorial interface you can choose words, phrases or categories that address what IMSI deems most relevant to your foreign visit—fun, sports, shopping, hotels, sightseeing etc. Also inside is a test in which the computer shows and says a word or phrase and you choose which picture it's talking about.

I went straight to the "fun" category in Russian and asked for phrases. What I was first presented with was the phrase "Where can I go to listen to music?" phonetically spelled out for the Russian with the English equivalent underneath. What, "Where can I go to listen to music?" looks like in phonetic Russian is: "Gdye ya ma goo po-sloo-shat moo zee ko?" If you want to know what it sounds like you'll have to either ask a Russian, call me up, or buy this disc (don't really call me up).

This phoneticism carries over into Japanese also. If you want to hear music in that country you'll have to say "Ongaku wa dokode kikemas ka?" But, for non-Cyrillic non-character languages like German, the words are inexplicably shown in the correct spelling for that nationality.

The Facts section is bursting with, well, facts about the nation of your choice with regards to history, geography, culture and tourism. Did you know "there are many sorts of farms in Russia producing crops such as vegetables, eggs and wool?" Facts constitutes a series of photos with just such scintillating captions, or you can request an automatic slide show to relieve your mouse finger.

Also offered is a "video," but that constitutes mere seconds of travelogue type footage with no narration.

Not exactly the fastest way to learn a language here, but certainly a handy means to finding the toilet at your next United Nations press party. ❑

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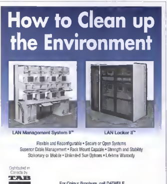

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Weaving your own Web site, Part XIII

Netscape Navigator 3.0 extensions

BY KEITH SCHENGILI ROBERTS

With the release of Netscape Navigator 3.0 Netscape introduced several new tags to the hypertext markup language (HTML) lexicon. These came more or less "out of the blue" as they were first introduced in the final beta of Netscape Navigator and they had not been passed for consideration to the World Wide Web Consortium (the standards body for HTML) before being presented in the new browser. They simply appeared.

In all, four new sets of tags were introduced. Two of these—the `FONT FACE` and the ability to insert background colors into tables—were already incorporated in Microsoft's Internet Explorer. (These were both covered in Part 10 of this series of columns.) However there are two entirely new HTML tags that are wholly Netscape's own. They incorporate functions layout designers have been seeking for a long time: the ability to set arbitrary vertical and/or horizontal spaces on a Web page, and the ability to lay out text and other elements on a Web page in multiple columns.

This article looks at these two new tags. Keep in mind that, at the moment, Netscape Navigator 3.0 is the only Web browser capable of resolving these tags.

Spaced out

The spacer tag is designed to add vertical or horizontal spacing within a Web page. It allows Web designers to add spacing elements within Web pages. The `<SPACER>` tag allows HTML authors to add spacing elements within their documents, such as indents, vertical or other horizontal whitespace.

In its simplest form, the space tag can add breaks within or between lines. One of its attributes is the `SIZE` attribute, which specifies the size of the space in pixels. `SIZE` can not take a percentage value. Another attribute is `TYPE` which has three attributes `HORIZONTAL`, `VERTICAL` and `BLOCK`. The following HTML code combines `SIZE` with the `HORIZONTAL` and `VERTICAL` attributes which also describes the effect you will get by inserting this code in a Web page.

```
This text is separated
<SPACER TYPE=HORIZONTAL SIZE=30>
by a horizontal spacer

This text is separated
<SPACER TYPE=VERTICAL SIZE=30>
by a vertical spacer
```

The `SPACER` tag can also be used as an invisible `IMG` tag, so that the empty space specified can be a block that has width and height. Not surprisingly then, the `TYPE=BLOCK` attribute is used exclusively with the `WIDTH` and `HEIGHT` attributes. Both the `WIDTH` and `HEIGHT` attributes can take either a numerical pixel value or a percentage. When used with the `ALIGN` attribute text and other elements on a Web page can be indented or otherwise spread across different areas of a Web page. The following HTML code demonstrates this effect.

```
Text before the spacing block
<SPACER TYPE=BLOCK WIDTH 50%
HEIGHT=50% ALIGN=LEFT>
This text appears to the side
<P>
The following hard rule seems
to start in the middle of the
page <HR>
```

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```
<HR>
<P>
This text also appears to t
side
<P>
So does this line of text
<p>
This line of text appears below
the spacing element
```

Despite what the code in this example might imply this is not always a hard and fast rule If you insert this code into a Web browser you will find that if you adjust the window of the browser certain lines of text are suddenly displaced upwards or downwards from the spacing element that appears on the page

Spacing blocks do not have to be specified to create an indented line simply use the `ALIGN` attribute with the `HORIZONTAL` attribute as in the following code example

```
<SPACER TYPE-HORIZONTAL SIZE 30
ALIGN=LEFT>This text is indented
by 30 pixels from the left
margin
```

However, spacing blocks do have one advantage over the `HORIZONTAL` or `VERTICAL` attributes they can take relative values Due to different screen resolutions, a setting using a specific number of pixels may display differently across a wide range of monitors A 30 pixel spacing element on a large monitor set to a very fine resolution may only show a slight indent You can achieve a similar indent effect by using the `BLOCK` attribute with a `WIDTH` set to a specific percentage as in the following code example

```
<SPACER TYPE=BLOCK WIDTH=5%
ALIGN=LEFT>This text is indented
by 5% from the left margin
```

In general a `BLOCK WIDTH` of 5-10 per cent serves as a good indenting space for a line

Multiple columns o-rama

It s now possible to do multicolumn layout of text and other elements on a Web page by using the new `<MULTICOL>` tag This new tag has three attributes `COLS` `GUTTER` and `WIDTH` The `COLS` attribute, which is mandatory specifies the number of columns desired The `GUTTER` attribute specifies the size of the space separating individual columns from one another The width of the `GUTTER` attribute is set by a number of pixels and has a default width of 10 pixels when not explicitly specified The `WIDTH` attribute sets the size of the entire column display in pixels, or as a percentage of the browser display When no `WIDTH` is explicitly specified, the columns are spread over the existing width of the browser window Each line in the following HTML code will be displayed within a separate column if you type in a Web page and view it through Netscape Navigator 3 0

```
<MULTICOL COLS-3 GUTTER-10
WIDTH=300>
The text in this sample is dis-
played in three narrow columns
<P>
This is a very recent addition
by Netscape to their set of
HTML tags.
<P>
It is currently <B>only</B>
supported by Netscape Navigator
```

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```
<P>
</MULTICOL>
```

The browser calculates columns of equal length by using a page-break algorithm based on the total length of the text it contains. Be careful when using preformatted tags (<PRE>) or other non-line-breaking elements (like large pictures) in a column. Preformatted tags override the normal column settings, so a long line of text in a column does not "break" within a column, but is instead carried over into an adjacent column, overwriting and merging with its text.

It is also possible to nest one multicolumn within another. The following HTML code shows two columns of text, with the second column containing an extra three columns of text.

```
<MULTICOL COLS=2 GUTTER=20
WIDTH=250 BORDER>
The text in this display is
rendered in two separate
columns
<P>
So is this
<P>
So is this particularly long
sentence that just goes on and
[illegible] and [illegible]
stops [illegible]
<MULTICOL [illegible] GUTTER=3>
Bu[illegible] three [illegible]
rate colu[illegible]
</MULTICOL
This tex[illegible] [illegible]ndered [illegible]
second c[illegible] of the internal
column display
</MULTICOL
```

There is no limit on nesting columns within each other, though keep in mind that the more columns that are nested within each other, the more likely that you will have non-breaking elements—like long words—overlapping into other columns, making them unreadable.

(GB says: Also, be aware that using multiple columns with long documents will annoy readers as they will have to scroll down and up again to read the whole text.) ❑

Keith Schengili-Roberts welcomes any comments, suggestions or HTML tips and tricks you may have. You can e-mail him at kschen@interlog.com. He is also working on a book about HTML for Academic Press called The Advanced HTML Companion, *due out later this year. Previous articles in the series can be found at* The Computer Paper *Web site at: http://tcp.ca/*

Swiss government rejects Internet referendums as too risky

BY SYLVIA DENNIS

BERNE, Switzerland (NB)—The Swiss government has turned down requests from the country's online community to allow citizens to vote on the country's referendums across the Internet, claiming that allowing votes on the Internet is not secure enough.

Switzerland, a country renowned for its democracy, holds national referendums several times a year, when the parliament deems an item is of sufficient national importance.

However, ministers have rejected suggestions that the voting sessions could be enhanced by allowing voting across the Internet, because of worries over the authenticity and accountability of Internet votes.

Six members of parliament had urged the government to look into Internet balloting as a way of luring non-voting Swiss, especially younger people, back into the country's democratic process.

According to a statement from the Swiss Federal Council, a motion from the ministers of the government had been rejected for security reasons. The council claims that voting on the Internet is too open to hacking by savvy computer users.

Acknowledging that there is also a risk of some conventional votes being fraudulent, the council said that the dangers of fraudulent votes are much greater where a computer network is involved.

The council added that Internet voting would also require a significant investment in information technology (IT) by the government for its citizens, in order to make Internet voting available to every citizen.

Critics of the government's decision point to France, where France Telecom deployed free Minitel (viewdata) terminals to phone users across the country, initially to replace paper telephone directories. ❑

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Protection of trademarks on the Internet

BY BRADLEY FREEDMAN

Cyberspace presents challenges to the protection of trademarks. Many businesses are establishing a presence on the World Wide Web to distribute information and market their products. Web site addresses are often important components of a successful marketing campaign. They serve as a combination trademark, phone number and street address. Businesses with an Internet presence ought to take steps to protect the trademark components of their addresses and other trademarks from infringing use by others on the Internet.

Trademark defined

A trademark is a distinctive mark used by an individual or entity to identify its wares or services and distinguish them from the wares or services of others in the marketplace. A trademark may be a word, design, slogan, telephone number, initials, acronyms, mnemonics, colors, sounds, or a combination of some or all of those elements.

A trademark owner has the exclusive right to use the mark in respect of his or her wares or services, and the right to prevent others from using a confusingly similar mark or using the mark in a disparaging manner that will depreciate or dilute the mark's value. Since a trademark is often one of the most valuable assets of a business and carries a great deal of good will, trademark owners should consider cost effective and timely steps to prevent conduct on the Internet that infringes their trademark rights.

Domain names

A business's presence on the Web starts with its domain name. Domain names (technically known as uniform resource locators or URLs) are simple words that substitute for the 12 digit Internet protocol addresses of sites on the Internet and the World Wide Web. Internet domain names are generally assigned on a first come, first-served basis by a number of organizations in the United States and Canada.

Domain names can be important business identifiers. They not only serve as an easy-to-remember address for Web sites, but also often incorporate key trademarks carrying substantial business goodwill. Examples of easily recognizable domain names are cnn.com (for the Cable News Network), cbc.ca (for the Canadian Broadcasting Corporation) and coca-cola.com.

Domain names can acquire considerable goodwill, and an undesired change in a domain name can cause inconvenience and loss of Web site traffic. In practical terms, it's like changing your name, phone number and street address all at the same time.

There have been a number of well-publicized disputes and lawsuits regarding the right to use commercially valuable domain names, such as macdonalds.com, mci.com and mtv.com. Such disputes may be the result of unintentional infringement or deliberate domain name grabbing.

The domain name dole96.com, for example, was registered for a site that parodies U.S. Republican presidential candidate Robert Dole, and the domain name peta.org was registered by the organization People Eating Tasty Animals before an application for the same domain name was made by the organization People For the Ethical Treatment of Animals.

Domain name disputes are resulting in lawsuits more often. For example, in February, Avon commenced legal proceedings in the U.S. alleging trademark infringement, unfair competition, and trademark dilution

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resulting from the use of the domain name avon.com. The case was settled with Avon obtaining control of the domain name.

Also in February, in a lawsuit commenced by Hasbro Inc., the manufacturer of the popular Candy Land game for young children, a U.S. court granted a restraining order and preliminary injunction precluding the continued use of the domain name candyland.com for a Web site featuring sexually explicit materials.

Trademark protection

There are some basic rules that ought to be followed so that trademarks are not misappropriated as domain names and valuable domain names are protected.

First, trademarks and domain names should be registered under trademark legislation. All trademarks and domain names (both with and without the generic suffix) should be properly registered pursuant to the Trademarks Act with appropriate international registration. In addition, so far as practicable, all trademarks should be registered as domain names with the appropriate Internet organization and used as such.

Second, as is required for all trademarks, the domain name should be used in connection with the goods or services in the appropriate manner. The domain name should appear on the Web site in a prominent fashion and not just as part of the location indicator. If the business sells goods, the domain name should be marked on the goods or their packaging or otherwise brought to the attention of the purchaser when the goods are sold and delivered to the purchaser.

Finally, domain names and Web site content should be searched on a regular basis to ensure that trademarks are not being used or otherwise infringed by others on the Internet and elsewhere. Timely legal steps should be taken to remedy all infringing conduct. ❑

Note: Legal advice should be obtained regarding these matters. This general discussion cannot be regarded as legal advice.

Bradley J. Freedman is a trial lawyer with the Vancouver law firm Ladner Downs, specializing in intellectual property law and commercial litigation. He can be reached at bfreedman@ladner.com.

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Training wheels for VB4

Continued from page **98**

A few words on value

The street price for this package is around $59 in Canada (less than the publisher's suggested price of $61.95 for the book alone) and includes a working copy of VB4 (the consumer version of this sells for about $125).

So except for not being able to compile a standalone executable file, you can get your feet wet for a fraction of what it would normally cost. Using this program might give you the confidence to move up to the professional version of Visual Basic 4 (although you may have to eat Kraft Dinner and peanut butter for a month to pay for it). Since you must have Windows 95 or NT to run the program, additional hardware requirements are the same as for Windows 95 or Windows NT.

However, there is a word of caution. If you already have Visual Basic 4 loaded on your computer, either do not load the working copy or load it into a different directory. Otherwise it may load the working copy over your original and foul it up.

If you cannot find the program at your local software retailer, have them order it from one of the three major Canadian software distributors or try Starpac directly in the United States. ❑

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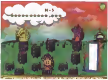
Junior continues Math Blaster dynasty

BY PEDRO ARRAIS

Math Blaster Jr	
Publisher	Davidson & Associates
Ages	4-7
Street price	$38.95
Requirements.	CD-ROM drive, Windows 3.1 Win 95 Macintosh



As a parent and a reviewer of children's software titles, I sometimes have to fight for time on the computer so I can complete my assignments on time Trying to pry the children away from the program I reviewed this month was enough to get young tempers going.

Computer software can have a very brief shelf life Hits are measured in months, not years The original Math Blaster, geared for children aged 6-12 has set records for not only being available for the last 14 years, but being an award-winning bestseller for almost that entire time

This year its creator, Davidson & Associates has added a new title for the preschool to Grade 1 crowd. Math Blaster Jr follows its older sibling in making numbers fun

Continued on page **112**

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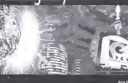

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As you well know if you are a parent of a 4- to 7 year-old, the attention span of children that age varies with the task. If they are really interested in something they can spend hours at it but if it bores them, they will let you know real fast

You will be happy to know that Math Blaster Jr. offers more of the former than the latter using a fun and games learning format In a nutshell, the program introduces the child to the concepts of numbers, skill-building activities and problem solving puzzles All of these are presented with eye catching graphics and smooth audio support. The cast of characters is whimsical and there is a sense of adventure and excitement in all the games the children get to play

Each module has solid educational theory behind it. To keep interest high, each has three levels of difficulty to challenge the children at their own pace There are four games. Puppet Theater which introduces the child to estimation, addition and subtraction, Whacking Pesters, which is much of the same; Transport Rocket with shapes colors and patterns being the focus and Marble Maze, which leads to prediction, problem solving and estimation.

When children are on the opening screen—the Blastership—they can choose from further activities, such as the Number Line, Grow Worms, Constellations, Shape Circus Book, and the Interstellar Radio for leisure activities The Number Line, for example, helps children conceptualize numbers and equations because numbers are displayed over points on a line Children then get a sense of where a number is along the continuum and can quickly identify which numbers are greater than or less than others!

Constellations provides the children with the opportunity to count by multiples (5's and 10's) skipping over numbers as they count As kids later begin to multiply this innocuous activity will provide them with an important base of experience.

A special note for fans of mazes Wowee!! The marble maze is so challenging (you can make your own in Free Play mode) that adults will be spending some time with it once the kids are in bed While not as complex as some adult mazes at its highest level it can make you squirm in your seat

Kids can explore the different activities by themselves in the Free Play mode For parents wanting more defined and measurable lessons choose the Mission Mode In this mode, children are required to complete assignments on each planet before moving on to the next The child earns medals and award certificates upon the successful completion of each level Parents can then check on how

Continued on page 114

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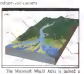
Microsoft adds dimension to atlas

BY PEDRO ARRAIS

Encarta 96 World Atlas

From	Microsoft Home
Street Price	$64.95
System requirements	CD ROM drive Windows 95 or Windows NT 3.51 or later

A passport can be defined as "something that gives one the right or privilege of passage entry or acceptance." A passport allows the bearer to enter and explore different countries and learn about different cultures and customs



The Microsoft World Atlas is indeed a passport to a multimedia world that holds no borders or barriers to the inquisitive mind. The title only describes one facet of what is contained in this CD ROM. Apart from being a detailed world atlas with more than a million place names it is also an encyclopedia of the planet we all call home

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Microsoft adds dimension

*Continued from page **113***

ety functions Learn to say simple phrases such as "Servus" and "Wie Gehts?" ("Hi" and "How are you?" in German). While statistics offer dry information this latter information "speaks" of the people—who they are and how different or how similar they are to us

Thirty-one countries are given further treatment with Family Portraits, which offer glimpses of the everyday life of a family in that particular country These photographs show the families with their belongings spread out before them as well as depicting common activities like shopping, eating a meal together, going to school, working, playing and more These families do not represent particular demographics but are just examples from the world community All are eye opening and extremely insightful

(Note Owners of slower machines may not be able to get the full benefit of the opening musical video clips Audio drop outs and a jerky picture may await you instead)

There are over 3 000 color photos that capture people cities countryside and natural wonders around the world. If you are interested in another perspective go up to a satellite view of over 50 different cities.

As you are learning about a new country click on the Did you Know? icon It will present you with such trivia as Did you know that Tanzania on the southeast coast of Africa, produces more than 80 percent of the world s supply of cloves? Kick back and listen to snippets of music and song from nearly every country from tribal music to operas. Regretfully most of the musical clips are too brief You can also click on a red word and hear it properly pronounced by a native speaker

Looking for something? You can look for a photo a piece of music, a city or statistics via the different search engines included You can visually navigate the globe quickly and when you are close to an area of interest zoom in to get a closer look You can specify the distance from which you wish to see the Earth—in miles or kilometers above the surface You can also see the world from a totally new angle when you put the N or north on the compass dial where south usually is Now you see how Australians view the world!

You can compare statistics from two or more countries, compare statistics from two or more years for the same country and so on Educators or students get special attention with how to prepare a report or a lesson plan The step by step advice balloon is easy to follow—just choose from the five themes of geography Location Place Human-environment Interaction Movement and Religion All articles and maps can be printed

Microsoft has raised the bar in the crowded software market for world atlases Not only is the Microsoft product a clean, easy-to-use program with an intuitive interface, it brings a warmth lacking in any of the competitors offerings The Family Portraits in particular give the countries you are curious about a human face This unique feature is indeed a passport to a better understanding than any map could ever give ❑

Math Blaster dynasty

*Continued from page **112***

many attempts their child made on each module before they were successful. This will help parents determine if they have chosen the correct level of difficulty for their child

Parents can also print out a 32-page activity book (it too has three levels) to add real-life activities that complement what their child is learning on the computer. As well there are four pages of Parent Tips (also printable) that enable a parent to understand the rationale behind the lessons provided Parental participation is encouraged at all levels but the program is easy enough for unaided use

As you can gather there is a lot packed into this program The activities seem endless and the playability is top notch. All you have to worry about is finding enough time for yourself on the computer once the kids discover the program. ❑

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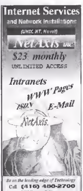

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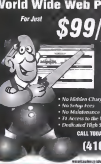

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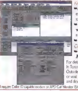

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Sega Pico:

The computer that thinks it's a toy

BY JEFF EVANS

The Pico device is a curvy purple plastic object that looks a bit like a big lunchbox. It has a lid that opens up creating a kind of easel where the software can be loaded, and instead of a keyboard there is a working space for a child to operate the Pico.

Pico software—called Playware—comes in the form of an integrated unit consisting of a children's color storybook attached to a video game cartridge by a molded plastic case. The Playware title is plugged into a cartridge connector near the hinge of the Playware device. The power on/off switch is located on the right middle edge of the lid.

The base of the Pico contains a pointing/drawing device called a Magic Pen, a drawing surface and two control surfaces on the left of the lower case. The Pico is powered by an external DC power supply, and audio/video output to a regular TV set is via a set of RCA style plugs that connect to output sockets on the lower right of the lid.

Assembly took about one minute and our resident five-year old children's software tester had no trouble figuring out how things fit together although our 12 year-old's assistance was required to do the connection to the TV set through the VCR.

The Pico came with a Playware title Richard Scarry's Huckle and Lowly's Busiest Day Ever. Sega also supplied several additional titles including Lion King: Adventures at Pride Rock, The Berenstein Bears' A School Day, and A Year At Pooh Corner. It was notable that the Playware titles are all derived from hugely popular children's books or films using well-known characters.

How to use Pico

The Pico Playware titles are different from typical video game software. They are almost completely non violent. For the most part, this is activity or learning software, designed to be simple and enjoyable for kids.

Like many childhood learning experiences, it is likely to be much more fun and effective if the parent is involved in playing with the child.

With the Busiest Day Ever title, for example, when you insert the book/cartridge and then power on the Pico, a picture appears on the TV screen, which matches the one in the storybook. You can activate animations or character voices by touching places on the book, which results in actions occurring on the screen. There are Additional Activity options, screen images not shown in the book, which can be activated by using the Magic Pen. For very young children, the point and touch feature means that they can make things happen by simply touching locations on the book.

The Direction Button control on the left of the Pico's base allows the user to guide characters around the screen. The software has puzzles, such as matching images and activities such as decorating cookies, mixing colors, hide and seek, playing with characters in a park, or painting images on screen.

The child can customize simple animations by selecting a figure in a scene by touching it with the Magic Pen, and pasting it down elsewhere on the screen. Animations can be played back by pressing the big red

Continued on page **122**

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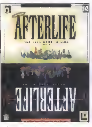

God may not have a computer but you do, and LucasArts wants to put you in the god like and rather odd position of building and then running Heaven and Hell with its latest release, Afterlife

It's Sim City meets the hereafter as you work to create and maintain your very own versions of both worlds simultaneously right there on your own desktop Be fore warned that we're not talking sensitive philosophical stuff here and the souls you control are not even of this earth However, once you've become involved, there are a number of moral dilemmas a lot of com, plexities and a ton of puzzling perplexities as you strive to maintain a smooth operation

First and foremost you've got to structure the two planes in such a manner that the basically good souls stick around up above and the baddies do the same down below Each area is like some otherworldly city with an array of buildings and amenities that suit their respective locations and you can pop new ones in whenever needed as long as you've got the money to do so—it seems even the afterlife is run like a business these days

Along the supernatural way you'll get assistance from Aria and Jasper two long term residents of disparate virtue who may be conjured up at any time from the Windows-like menuing system running across the top of the screen Since there isn't much of a manual to speak of (aside from the Player's Guide available from LucasArts for an extra $20!) these two are about all you've got, and the game definitely carries a tremendous learning curve for all but the hardiest adventure gamers.

On the other hand, with so many options available there would appear to be almost unlimited gameplay As is the norm with LucasArts products, the animation is excellent and there are a bunch of cute special effects surprises and great music en route, including a number of cheats and "easter eggs" that you should be able to find on most online gaming forums.

Is Afterlife for you? If you're offended by the whole idea or prefer action over mental struggles then it certainly isn't. But if you enjoyed the world building of Sim City and take a shine to the sense of humor and art found in other LucasArts games such as Full Throttle and Day of the Tentacle, it very well could be Just remember it does take a while to pick up and because of that and the subject matter, it is most probably not recommended for pre teen audiences ❑

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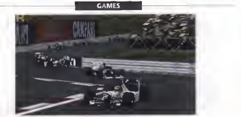


Grand Prix II takes a checkered flag

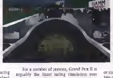
BY GORD GOBLE

Grand Prix II

From	Microprose
Format	DOS, Windows 95
Requirements:	100 MHz 486DX/4 8MB RAM
	2x speed CD-ROM drive
	DOS 5.0 or later.
Recommended:	90 MHz Pentium processor
Street price	$60

With the advent of the Pentium processor came a mad rush of pretty nifty 3D texture mapped simulations—programs that simply couldn't run (properly, anyway) on pre-Pentium technology While a lot of these sims involve fighting jets, we've recently seen a surge in automobile racing software too, namely from acknowledged industry leader, Papyrus

But now with the release of Grand Prix II, Microprose's much ballyhooed successor to 1992's World Circuit, Papyrus suddenly has a whole lotta competition on its hands We consumers on the other hand have one more reason to begin thinking seriously about the next upgrade in processor technology



For a number of reasons, Grand Prix II is arguably the finest racing simulation ever made Graphically it's far and away the best thing going With switchable VGA/SVGA modes, a seemingly infinite number of graphic options, mirrors that accurately reproduce what's out there (including textures—a first for the genre) light shading, and scenery that's both intricate and true-to-life, GP II is in a league of its own.

Tires will smoke when skidding, underbodies will spark when grounding out, and unburned fuel will momentarily ignite as it leaves the exhaust pipe. Expect your car to tilt when riding over a curb and lose parts or become airborne when involved in severe collisions

Game designers have placed great importance on visual details such as real life color schemes and logos track-side billboards and markers, buildings lush green backgrounds cloudy skies, and just about everything else you might see on television broadcasts of real Formula One races Unfortunately you'll have to have a top-notch Pentium to run all this beautiful stuff, or risk taking frame rate and/or graphic detail hits on slower machines.

But what really puts this one over the top is its accessibility In short, anyone from rookie to hardened veteran can play it. Newcomers will find that GP II is rife with sensible driving aids (automatic brakes, auto-

Continued on page **122**

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Microsoft brings back video arcade oldies

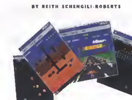
BY REITH SCHENGILI-ROBERTS

Return of Arcade
Manufacturer: Microsoft
System requirements: Microsoft Windows 95, 486DX 66MHz or higher, 8 MB of RAM, 6MB of available hard-disk space, SVGA 256 color video display and a sound system to hear the audio. Joystick recommended.
Price: $44.95

Now that Generation X-ers are hitting their 30s, they are starting to get nostalgic for the old days, when Punk music was dangerous, a home PC wasn't necessarily a Mac or an IBM, and when video game arcades featured such classics as PacMan, Pole Position, Galaxian and Dig Dug. Now these arcade favorites are back courtesy of Microsoft, in Return of Arcade.

This collection of games follows on the success of Microsoft's other vintage arcade game pack, Microsoft Arcade. Whereas Microsoft Arcade focused on some classic games released by Atari like Missile Command, Battlezone, Asteroids and Centipede, Return of Arcade features games that were made by Namco during the Golden Age of video games between 1979-82.

Microsoft has taken great care to make the games appear as much like the quarter-gobbling originals as possible. The look and feel of the games are identical to the originals, enough so that you'll have to resist the urge to stick quarter after quarter into your disc drive. Anybody with a sound card will appreciate the sounds of the games, each recorded and digitized from the original arcade versions.



Return of Arcade comes with four games: DigDug, Pole Position, Galaxian and PacMan. In Dig Dug—the most bizarre game of the collection—you play a character who digs under ground, chasing subterranean monsters, and then blows them up with an air pump or drop rocks on them from above before they get a chance to stop you. Pole Position was a revolutionary race car game, the first to offer a car level point of view (most of Pole Position's predecessors featured a perspective from above the track).

Galaxian was a kind of "next generation" Space Invaders, and involved more strategy. Unlike Space Invaders, Galaxian's alien bugs don't wait to get shot—they come down after you in waves of attacks. Galaxian has smarter bad guys than Space Invaders, and no shields. Game play was, and is, frenetic.

PacMan is the game everybody who lived through 1982 will remember. It became a pop phenomenon—people wore PacMan deely bopper hats, listened to the song *PacMan* by Buckner and Garcia, and sank endless streams of quarters into playing this game.

The only complaint about the collection is that the performance of Pole Position is sluggish, and it is hard to play using the keyboard (a mouse or joystick are much preferred).

Each of these games is configurable, and include features you will wish you had control over in the real arcade games, like the ability to add more lives at will or make your enemies weaker. Under the Help section of each game are comments from the original game designers on the background of the games and how they were developed.

All of these games were guaranteed quarter-suckers when they appeared more than a dozen years ago. If you already have Microsoft Arcade or Williams Arcade Classics, or simply wish to play some really good arcade games, you will enjoy this collection. This reviewer can still remember times when his allowance was spent at the arcade hall, playing these games until the quarters ran out. If only those quarters had been spent investing in Microsoft stock at that time. ❑

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Grand Prix II

Continued from page **120**

matic gears, self-correcting spin, indestructible car, visible ideal driving line, suggested gear and throttle assistance) and that opponent strength levels can be tailored to suit their level of expertise. This all means that anyone can get around the track comfortably within minutes of taking the wheel, something that is just not possible with Papyrus products such as IndyCar II and NASCAR Racing.

Experts, meanwhile, with driver's aids removed and the competition set to "Ace," will find the drive quite a bit tougher and much more to their liking. The car model is never quite as "touchy" as IndyCar's and although that may not be acceptable to the absolute hard-core people, it should be just what the doctor ordered for everyone else.

Add in extensive car setup possibilities that'll really get the car flying if done just right, and frighteningly human artificial intelligence and there won't be many who'll ever get bored with the game.

If you tire of racing against computer traffic, GP II permits two-player games, either remotely via modem, side-by-side via null modem, or turn based on one machine with a single joystick. After the race, statistics are both plentiful and printable, but the victory celebration can only be considered weak when taking into account all the hard work it took to get you there. Another sour note comes from the game's replay, a short and unimaginative affair that can be, albeit rarely, completely wrong.

Yet the foibles are few and certainly pale in comparison with all that is right with Grand Prix II, the most complete and enjoyable racing sim yet devised. ❑

Sega Pico

Continued from page **118**

Animation button on the Pico base. The Magic Pen can be used for tracing or freehand drawing pictures.

One disadvantage of the Pico, compared to a PC, is that pictures or animated creations can't be printed out or saved to disk. However, because the Pico can be linked to the TV, you can videotape your child's creations if you have a VCR.

The Pico is a very interesting solution to the problem of creating a computing/appliance—in this case, a device that incorporates many features of children's books, but adds audio, animation, a range of interactivity and the potential for the child to perform a variety of art and design activities.

Pico is a well-designed product, and especially with the involvement of a caring parent, it can be a good source of fun and enrichment for a child, and serves as an enjoyable introduction to interactive computer use. ❑

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Life in the nerd lane

The Dilbert Principle

BY JEFF EVANS

The Dilbert Principle
Author Scott Adams
Publisher Harper Collins
Price $28
ISBN ISBN 0-88730-787 5
Hardcover 336 pages

Scott Adams has become a kind of patron saint" of the computer culture by virtue of his ability to sum up the frustrations, confused thinking, and characteristic madness of working on the bleeding edge of the Information Age.

In this book, which is a kind of antidote to the relentless tide of rah-rah business gurus overrunning North America, Adams pokes often wicked fun at the doublespeak and greed that fills office life in the '90s.

For example, a boss gathers his team and intones: "This will be a tough year for the company. It will take a special kind of team to get by." The employees react as they figure they are expected to: "Go Team!" "Team! Team!" "Yes!"

The boss adds the important detail, "Specifically, it will take a much smaller team." Ouch.

As one who has experienced the joy of freedom from a regular paycheck due to corporate downsizing, this reviewer has great sympathy for Adams' dissection of the downsizing mania. Adams writes breezily and with humor, alternating between cartoon strips and blocks of text.

Although I will probably never adore Adams' minimalist drawing style, I must admit to having become a great fan of his humane, perceptive cataloguing of human hope and foolishness. This is a great gift for any computer professional, but you'll want to read it before giving it away. ❑

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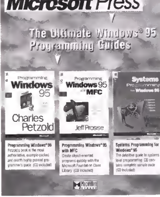

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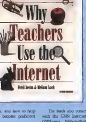
NetLearning aimed at educators

BY JEFF EVANS

NetLearning: Why Teachers Use the Internet	
Author	Ferdi Serim and Melissa Koch
Publisher	O'Reilly/Songline Guides
Price	$35.95
ISBN	1-56592-201-8
Softcover (includes CD-ROM), 300 pages, 1996	

A new title from O'Reilly, *NetLearning: Why Teachers Use the Internet* by Ferdi Serim and Melissa Koch offers a timely, intelligent picture of the potential of the Internet as a learning and teaching resource, from a teacher's perspective.



The book looks at some current examples of how the Internet enriches learning, and examines some of the possibilities for readers to experiment with the Internet in their own classrooms. There is a good discussion of Internet fundamentals—what it is, how it works, how to get hooked up, and how to help students and teachers become proficient with surfing the Net.

NetLearning then goes on to discuss how and why it can find a place in the broader subject of learning. The authors try to place the current technique of the Internet within a broader vision of lifelong learning and community building. An index on Internet Pioneers and World Wide Web Resources helps round out the book's usefulness as a general resource.

By their nature, Internet books tend to have a limited shelf life, as the phenomenon they are describing is changing so rapidly. NetLearning, however, is better than many other Internet books we've seen. It tries to link the ephemeral technology of the Internet today with longer-term considerations and possibilities for the future.

Reading this book should help both students and teachers think about the potential and the limits of the Internet at a time when many in the education system are running hard to catch up with this new technology.

The book also comes with a CD-ROM with the GNN Internet service and the GNNpress Web-authoring utility for Windows 95. ❑

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A solid guide to Internet business opportunities

BY KEITH SCHEBGILI-ROBERTS

A Small Business Guide to Doing Big Business on the Internet
Author Brian Hurley and Peter Birkwood
Publisher Self Counsel Press
Price $14.95
ISBN 1-55180-029 2
Softcover 174 pages 1996

These days there are a ton of books about the Internet covering it from just about every conceivable angle There are books on HTML books on using Java on the Web and books on how to do research on the Net

However as Internet use becomes more and more pervasive among the public and in industry more books are beginning to appear on how to make money from the Internet. Unfortunately many of them verge on hucksterism and are short on Net savvy and business smarts.

An exception is Hurley and Birkwood's *A Small Business Guide to Doing Big Business on the Internet*. Despite the corny title the book provides a solid broad guide to the type of business possible on the Net

There's no doubt that the business potential of the Net is enormous. There are hundreds of thousands if not millions of potential customers around the world who have Net access Increasingly businesses are realizing that it is not a passing fad and are investing their resources into creating an online presence So how do you get in on the rapidly developing Net biz?

This book tells you all about the various business possibilities available on the Internet and offers several different perspectives on the situation. If you are a would be Net entrepreneur it details the types of services you can consider such as Internet training research or providing Web content for others If you are in a firm looking to get a Web presence the book will tell you what to look for in an Internet service provider or in a Web author

It provides examples of businesses that have got on the Net, examines their reasons for getting on the Net and tells you how you can check them out for yourself Much of this is actually pretty standard fair—it will not be obvious to the Net newcomer but for anybody who has been on the Internet or the Web for more then a few months a lot of this will seem obvious

Where this book stands out is in providing details on laws that apply to online commerce how to set up a sound Net business strategy and the art of closing a sale

This book provides a very good broad survey of the business possibilities of the Internet If you are interested in starting up an Internet or Web-based business or are looking into having somebody else set up your electronic storefront but are not sure what is required or what to look for this is a good start.

This is a good book for Net business newbies. Experienced Net types will not find much new here but may find the sound business principles useful when charting the growth of their own virtual firm

Doing Big Business on the Internet is a good easy to-read primer on the subject. ❑

Rating:
Information content **1/2
Readability ****1/2
Intended for Beginner
Overall Rating ***

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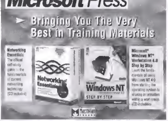
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Logitech mice reach 100 million

FREMONT, Calif. (NB) — Logitech began selling pointing devices in 1982. Fourteen years later the company celebrated the shipment of mouse number 100 million earlier this year and at the same time was getting rave reviews for "HyperJump," a Windows 95 feature included in MouseWare 7.1.

Douglas C. Engelbart invented the first "mouse" in 1963 while he was at Stanford Research Institute (SRI) and in 1968 a mouse made its commercial debut at the ACM/IEEE-CS Fall Joint Computer Conference.

Engelbart is also credited with developing the concept and initial implementation of "windows," "hypertext" (later named and commercialized by Ted Nelson) and collaborative computing." His SRI location was the second node of the ARPAnet or what eventually turned into the Internet. He is now part of The Bootstrap Institute at Logitech's Fremont, Ca. headquarters.

From Engelbart, the mouse took a shot at commercialization with Xerox, but in the end it was Apple Computer which really made the mouse a common computing peripheral.

On the IBM/clone side, Logitech established itself as an early leader in the pointing device arena and set itself apart with a three-button design. Riding the coat-tails of Microsoft's Windows, Logitech built a 40 per cent share of the pointing-device market and became the supplier of mice and accompanying software for 18 of the top 20 personal computer systems manufacturers.

In its latest release of MouseWare software, Logitech unveiled a Windows 95 feature called "HyperJump." It allows a user to click the center button and open a small one-inch square containing nine squares. Eight of the squares contain Windows 95 commands which allow a user to automatically jump to resizing a window, minimizing or closing an open application, opening the Start window, opening a dialogue box, jumping to vertical and horizontal scroll bars, and jumping to a previous window. The new software ships with MouseMan 96 and retails for about $59.95.

Logitech spokesperson Amanda Higgins told Newsbytes: "We are getting really great reviews about HyperJump. It is one of the most effective tools available for almost instantly improving work speed and performance in Windows 95. It simply reduces the amount of movement needed to issue some of the most common Windows 95 tasks."

MouseMan 96 requires a 386 or faster processor. While it is optimized for Windows 95, the new mouse also works with Windows 3.x and DOS.

Other features of MouseWare 7.1 include the ability to customize cursor size, color and sensitivity, the ability to use different cursor trails and a "SmartMove" which allows the cursor to jump to the next logical area in a document. For instance, if a dialogue box opens the cursor will jump to the "OK" button.

Recently Logitech also added a new cordless mouse based on radio transmission, and TrackMan Marble, to its line of pointing devices. The latter incorporates the company's Marble Electronic Sensing Technology. ❑

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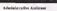

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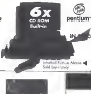

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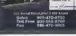

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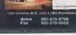

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